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# ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 1988

## HEARINGS

BEFORE A

## SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS UNITED STATES SENATE

ONE HUNDREDTH CONGRESS

FIRST SESSION

PART 1 (Pages 1-751)

APPALACHIAN REGIONAL COMMISSION
DEPARTMENT OF THE ARMY
Corps of Engineers—Civil
DEPARTMENT OF THE INTERIOR
Bureau of Reclamation
TENNESSEE VALLEY AUTHORITY

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# ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 1988

THURSDAY, FEBRUARY 19, 1987

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
*Washington, DC.*

The subcommittee met at 2:05 p.m. in room SD–138, Dirksen Senate Office Building, Hon. J. Bennett Johnston (chairman) presiding.

Present: Senators Johnston, Hollings, Cochran, Sasser, and Domenici.

## DEPARTMENT OF THE ARMY—CIVIL

### CORPS OF ENGINEERS—CIVIL

### STATEMENT OF ROBERT K. DAWSON, ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

ACCOMPANIED BY:
- LT. GEN. E. R. HEIBERG III, CHIEF OF ENGINEERS
- MAJ. GEN. HENRY J. HATCH, DIRECTOR OF CIVIL WORKS
- DON CLUFF, CHIEF OF PROGRAMS
- STEVEN DOLA, DEPUTY FOR BUDGET
- DR. G. EDWARD DICKEY, DEPUTY FOR PROGRAM PLANNING
- DR. BORY STEINBERG, CHIEF OF POLICY

### OPENING REMARKS

Senator JOHNSTON. The hearing will come to order. I want to welcome everyone here today as we begin our hearings for the fiscal year 1988 budget programs and activities under the jurisdiction of the Energy and Water Development Appropriations Subcommittee.

Before we turn to today's witnesses, I want to make a few brief comments. First, even though the majority party in the Senate and the chairmanship of this subcommittee has changed since last year, I do not expect any major changes in the way we operate. Behind Senator Hatfield's effective leadership over the last 6 years, we have accomplished a great deal. We have worked well together and have been able to find a common ground of compromise which is so important in this subcommittee. I want to thank Senator Hatfield for his hard work on items of mutual interest and I look forward to working closely with him in the coming months.

Now, it is a pleasure to introduce to the committee the Assistant

Secretary of the Army for Civil Works, Mr. Robert K. Dawson; Lt. Gen. E. R. Heiberg, Chief of the U.S. Army Corps of Engineers; Maj. Gen. Henry J. Hatch, Director of Civil Works; and finally, Mr. Don Cluff, Chief, Programs Division, Directorate of Civil Works.

Later, following the overview testimony, we will hear from General Edgar, Division Engineer for the South Atlantic Division of the Corps.

Mr. Dawson, I would be remiss if I did not congratulate you on your hard work and efforts in making the Water Resources Development Act of 1986 a reality. This is the first major water resources authorization legislation to be enacted since 1970, and I am convinced that had it not been for your personal hand, we would not be where we are today and the critical water resources needs of the country would continue to go unmet.

Finally, I should remind the members that the division engineers for the Corps will be before the committee over the next several days to bring us up to date on the activities within their regions. So I would urge the membership to hold their specific project questions and address them, if possible, to the appropriate division engineer.

If there are no other comments, Mr. Dawson, you may proceed.

### INTRODUCTION

Mr. Dawson. Thank you very much, Mr. Chairman, and thank you for those very generous comments. I might say at the outset that it is our view that without the leadership of this subcommittee and its assistance, the legislation that you alluded to would also not have come into being.

We are pleased to appear before you today to present our fiscal year 1988 budget recommendations. You have already introduced most of the gentlemen who are here with me, Mr. Chairman. I want to also introduce to you my new principal deputy, Mr. John Doyle, and ask him to stand. John has recently joined me from the staff of the House Public Works and Transportation Committee.

Also present here today are Mr. Steven Dola, my deputy for budget; Dr. G. Edward Dickey, my deputy for program planning; and Dr. Bory Steinberg, Chief of Policy for the Corps.

With your permission, Mr. Chairman, I would like to proceed by asking that our prepared statements, that of myself and General Heiberg, be placed in the record of these hearings and then we be allowed to summarize briefly our statements.

Senator Johnston. Yes; those will be put into the record.

Mr. Dawson. Thank you, sir.

### WATER RESOURCES DEVELOPMENT ACT OF 1986

This appearance is noteworthy, as the chairman has already alluded to, in that it follows passage of the Water Resources Development Act of 1986, which confirmed the reforms to the water resources program agreed to by the Congress and the administration and incorporated by this subcommittee into the funding of the fiscal year 1985 and fiscal year 1987 new construction starts. With the passage of this act, Congress and the President have provided this nation's water program with the direction it needs. As I mentioned earlier, we want to acknowledge and thank this subcommittee for its leadership in bringing this about.

### FISCAL YEAR 1988 BUDGET

If I may, I would like to touch briefly on our fiscal year 1988 civil works budget request. The budget for this fiscal year continues the President's commitment to support responsible development of the nation's water resources. The budget is best understood in relation to the following Public Law 99-662 reforms which it embodies: First, enhanced nonfederal cost sharing and financing of construction projects; second, new sources of revenues to fund harbor maintenance in the form of ad valorem fees to be collected under the newly enacted Harbor Maintenance Revenue Act; and three, increased nonfederal participation in project formulation and development through study cost sharing.

To summarize, the fiscal year 1988 program totals $3.5 billion and is predicated on federal appropriations of some $3.27 billion and associated nonfederal contributions of $233 million. The federal budget request includes the appropriation of some $187 million in receipts from two trust funds supporting the civil works program: the inland waterways trust fund, and the harbor maintenance trust fund. Offsetting receipts that would be collected under existing law total $29.1 million, and under pending legislation, another $19.2 million. This results in a net federal appropriation of $3.23 billion.

### CONSTRUCTION, GENERAL

Under "Construction, general," Mr. Chairman, the budget request is a remarkably good one, considering the necessity for budget restraint, and could not have been accomplished without the reforms that this subcommittee helped become embodied in Public Law 99-662. Federal and nonfederal investment in the projects and programs funded under the "Construction, general," account total just over $1.4 billion.

This is a significant milestone. As the chairman is aware, for the last 6 years or so our O&M budget has outpaced our construction budget. And this year, for the first time in many years, we are back to where I think a good program should be, with its construction budget outpacing the O&M budget.

### CONSTRUCTION INVESTMENT LEVEL

The key to sustaining such an investment level is the enhanced nonfederal share of project costs and the financing of that share during construction. Execution of the fiscal year 1988 budget envisions cash contributions of some $221 million and the appropriation of some $38 million from the inland waterway trust fund.

An appropriation of general funds will actually total $1.15 billion, with the nonfederal share amounting to almost 23 percent of this total.

The level of nonfederal contributions will continue to rise as the enhanced cost sharing provided for in Public Law 99–662 applies to a greater portion of the projects under construction.

In this regard, Mr. Chairman, I would like to provide the subcommittee, for the record, a summary of our established cost-sharing guidelines which we have recently sent out to the field.

[The information follows:]

## SUMMARY OF WATER PROJECT COST SHARING
## AS MODIFIED BY
## THE WATER RESOURCES DEVELOPMENT ACT OF 1986 (PL 99-662)

## NON-FEDERAL RESPONSIBILITIES

Non-Federal Interests Are Responsible For:

1. Commercial Harbors (Section 101). (See Attached Examples Illustrating Cost Sharing Principles)

   a. Construction.
      (1) 10% of the cost of general navigation features (GNF) for depths not in excess of 20 feet, paid during construction (PDC).
      (2) 25% of the cost of GNF for increment greater than 20 feet but not in excess of 45 feet, PDC.
      (3) 50% of cost of GNF for increment over 45 feet, PDC.
      (4) For projects consisting of GNF that do not modify project depths, a non-Federal contribution required of 10%, 25%, or 50% of the cost of GNF, based upon the depth of existing project. Contributions of paragraphs 1.a.(5),(6), and (7) also apply to such projects.
      (5) An additional 10% of the cost of GNF repaid over a period not to exceed 30 years. Credit is allowed for the value of lands, easements, rights-of-way, relocations and dredged material disposal areas (LERRD) against this 10%, except for utility relocation costs.
      (6) LERRD
      (7) Perform or assure the performance of all relocations of utilities necessary to carry out the project. (An exception is made for deep-draft harbors where one-half of the cost of each such relocation shall be borne by the owner of the facility being relocated and one-half of the cost of each such relocation shall be borne by the non-Federal interest)

   b. Bridge Modifications.
      (1) Costs not assigned the bridge owner (using Truman-Hobbs principles), are project costs considered to be a part of the GNF.

   c. Operation and Maintenance.
      (1) For deep draft harbors, 50% of the excess of the cost over the cost that would be incurred if the project had a depth of 45 feet.
      (2) LERRD needed for operation and maintenance.
      (3) The 0.04% tax on commercial cargo is appropriated to the Harbor Maintenance Trust Fund. Appropriations from this fund provide up to 40% of systemwide O&M costs.

   d. Prevention or Mitigation of Erosion or Shoaling Attributed to Federal Navigation.
      (1) Construction shared in same proportion as the cost sharing provisions applicable to the project causing the shore damage.
      (2) OMRR.

2. Inland Waterways (Section 102). (See Attached Examples Illustrating Cost Sharing Principles)

a. Construction.
  (1) 50% of the costs through fuel taxes paid into the Inland Waterways Trust Fund (IWWTF) when specifically authorized. Projects in Title III, Sections 1103(j) and 844, and in PL 99-88 have been authorized to use trust funds. Cost sharing for projects not authorized to use funds from the IWWTF will be in accordance with the provisions of the authorizing legislation.

b. Operation and Maintenance.
  (1) LERRD, if required for projects not funded from IWWTF.

3. Flood Control (Section 103). (See Attached Examples Illustrating Cost Sharing Principles)

a. Construction (Structural).
  (1) Cash payment of 5% of the costs assigned to flood control (FCC), PDC.
  (2) LERRD.
  (3) Added cash contribution needed to make total non-Federal share equal to 25% of FCC, PDC.
  (4) Contributions in excess of 30% of FCC (5% cash plus 25% LERRD) may be reimbursed over a period not to exceed 15 years.
  (5) Maximum contribution is 50% of FCC (5% cash plus 45% LERRD).
  (6) Cost sharing subject to ability to pay under Section 103(m).

b. Construction (Non-Structural).
  (1) LERRD, limited to 25% of FCC.
  (2) Added contribution to make total equal to 25% of FCC (applies when LERRD is less than 25% of FCC), reimbursed over period not to exceed 15 years.
  (3) Cost sharing subject to ability to pay under Section 103(m).

c. Operation, Maintenance, Replacement, & Rehabilition (OMRR).
  (1) 100%.

4. Hydroelectric Power (Section 103). * #

a. Construction.
  (1) 100%, of the joint and separable costs.

b. OMRR.
  (1) 100%.

5. Municipal and Industrial Water Supply (Section 103). *

a. Construction.
  (1) 100%, of the joint and separable costs, PDC. * *

b. OMRR.
  (1) 100%.

6. Agricultural Water Supply (Section 103). *

a. Construction. (New Projects).
  (1) 35% of the joint and separable costs assigned to agricultural water supply, PDC. * *
  (2) Cost sharing subject to ability to pay under Section 103(m).

b. OMRR. (New Projects).
  (1) 100%.

c. Interim Use of M&I Water Supply Storage for Agriculture.
  (1) To be determined.

7. Recreation (Section 103). *

a. Construction.
  (1) 50% of the separable costs, PDC. * *
  (2) 50% of joint and separable costs allocated to recreational navigation at harbor and inland waterway projects, PDC. * *

b. OMRR.
  (1) 100%.

8. Hurricane and Storm Damage Reduction (Section 103). *

a. Construction.
  (1) 35%, of the joint and separable costs, PDC. * *

b. OMRR.
  (1) 100%.

9. Aquatic Plant Control (Section 103). *

a. 50% of control operations, PDC.

10. Beach Erosion Control (Section 103). *

a. Construction.

  (1) Shared in accordance with appropriate project purpose, except 100% for costs assigned to benefits for privately-owned shores limited to private use, and to prevention of private land loss.

b. OMRR.
  (1) 100%.

11. Water Quality Enhancement (Section 103). *

a. Shared in accordance with appropriate project purpose.

12. Fish and Wildlife Mitigation (Section 906). (See Attached Examples for Commercial Harbors and Flood Control Projects Illustrating Cost Sharing Principles)

a. Construction and OMRR costs are allocated among project purposes and shared or reimbursed to the same extent as such other project costs are shared or reimbursed.

13. Fish and Wildlife Enhancement (Section 906).

a. Construction.
  (1) None, if the action:
    -Provides benefits to species identified by the National Marine Fisheries Service as of national economic importance, species that are subject to treaties or

international convention to which the United States is a party, and anadromous fish;
-Is designed to benefit species that have been listed as threatened or endangered by the Secretary of the Interior,or
-Is located on lands managed as a national wildlife refuge.

(2) 25% of the joint and separable costs assigned to fish and wildlife enhancement, if benefits are other than shown in paragraph 13.a.(1).

b. OMRR.
(1) 25%.

14. Studies (Section 105).

a. Reconnaissance.
(1) None.

b. Feasibility (Other Than Inland Waterways).
(1) 50%, during study period, not more than one-half may be made by provision of services, materials, supplies, or in-kind services necessary to prepare feasibility report.

c. Feasibility (Inland Waterways).
(1) None.

15. Preconstruction Engineering and Design (PED).

a. Authorized for Construction.
(1) Shared in the same percentage as the purposes of the project. The Federal government finances the non-Federal share, with adjustments to reimburse costs during the first year of construction.

b. Authorized for PED (Section 105).
(1) 50%, of the cost of planning and engineering, during planning and engineering. Planning and engineering constitutes all work necessary for a General Design Memorandum (GDM).

16. Design (Section 105).

a. Shared in the same percentage as the purposes of the project. The Federal government finances the non-Federal share of design, with adjustments to reimburse costs during the first year of construction. Design constitutes all work after approval of the GDM, including feature design memoranda and plans and specifications.

17. Dam Safety Modifications To Existing Dams (Section 1203).

a. Construction.
(1) 15% of modification costs to be assigned to project purposes in accordance with the cost allocation in effect when construction of modification is initiated. Costs so assigned are then shared in accord with the cost sharing in effect for each purpose when the initial project was constructed. Payment will be in accordance with existing contracts for the reimbursable purposes. An exception is made for costs assigned to irrigation, which the Secretary of the Interior is responsible for recovering in accordance with repayment provisions of P.L. 98-404.

b. OMRR.
   (1) Shared the same as basic project OMRR.

18. Waiver of Cost Sharing for the Territories (Section 1156).

a. Local cost sharing requirements for all studies and projects in American Somoa, Guam, the Northern Mariana Islands, the Virgin Islands, and the Trust Territory of the Pacific Islands, will be reduced by an amount up to a cap of $200,000, for each study and $200,000 for each project, in accordance with Section 1156. A non-Federal share for each study or project will be determined using the general cost sharing criteria, and then reducing this amount by $200,000, or to zero if the non-Federal share is less than $200,000.

19. Ability to Pay for Flood Control and Agricultural Water Supply (Section 103m).

a. The following interim guidance is applicable under 103(m) pending development of detailed procedures:
   (1) A willingness to enter into a binding project cost sharing agreement is considered prima facie evidence that the sponsor has the ability to pay.
   (2) If the sponsor indicates it cannot participate, and analysis of the sponsor's financial condition corroborates an inability to cost share, two alternatives should be explored: the possibility of creating a new taxing district; and, the possibility of involving other levels of local or state government.

* Non-Federal interests for these project purposes shall provide LERRD, except to the extent limited by the cost sharing provisions applicable to each purpose. The value of these contributions shall be creditable toward the non-Federal share for each project purpose. The details of how this requirement is to be applied in the case of multiple purpose projects with more than one non-Federal sponsor are still being developed.

# Section 103(c)(1) provides that cost-sharing for hydropower projects shall be in accordance with existing law, which anticipates recovery of project costs after project completion through rates set by the appropriate Federal marketing administration (PMA). As a matter of policy, every effort should be made to seek payment during the period of construction. Projects constructed using a sponsor's contribution during construction will require a three-way agreement between the sponsor, the Department of the Army, and the appropriate PMA.

* * Section 103(k) permits the Secretary to recover these costs with interest over a period not to exceed 30 years. Every effort should be made to obtain payment during the construction period and any exception will require prior ASA(CW) approval.

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| | Harbor Improvement Increments | | | Illustrative Harbor Projects | | Inland Waterways | |
|---|---|---|---|---|---|---|---|
| | (1)<br><20'<br>= | (2)<br>>20'<45'<br>= | (3)<br>>45' | (4)<br>Channel from 15' to 25' 1/ | (5)<br>Channel from 42' to 50' 2/ | (6)<br>Trust Fund Appropriations Authorized | (7)<br>No Trust Fund Authorization |
| 1. Basic Project (w/o Mitigation) | | | | | | | |
| a. Construction | 900 | 900 | 900 | 1800 | 1800 | 600 | 600 |
| b. LERRD | 0 | 25 | 50 | 25 | 75 | 100 | 100 |
| c. Utility Relocation | 0 | 25 | 25 | 25 | 50 | NA | NA |
| d. Subtotal | 900 | 950 | 975 | 1850 | 1925 | 700 | 700 |
| 2. F&W Mitigation | | | | | | | |
| a. Construction | 100 | 100 | 100 | 200 | 200 | 50 | 50 |
| b. LERRD | 0 | 25 | 50 | 25 | 75 | 50 | 50 |
| c. Utility Relocation | 0 | 0 | 0 | 0 | 0 | NA | NA |
| d. Subtotal | 100 | 125 | 150 | 225 | 275 | 100 | 100 |
| 3. Erosion or Shoaling Prevention | | | | | | | |
| a. Construction | 30 | 40 | 40 | 70 | 80 | NA | NA |
| b. LERRD | 10 | 15 | 20 | 25 | 35 | NA | NA |
| c. Subtotal | 40 | 55 | 60 | 95 | 115 | NA | NA |
| 4. Total Project | | | | | | | |
| a. Construction | 1030 | 1040 | 1040 | 2070 | 2080 | 650 | 650 |
| b. LERRD | 10 | 65 | 120 | 75 | 185 | 150 | 150 |
| c. Utility Relocation | 0 | 25 | 25 | 25 | 50 | NA | NA |
| d. Total | 1040 | 1130 | 1185 | 2170 | 2315 | 800 | 800 |
| 5. Non-Federal Contribution during Construction | | | | | | | |
| a. Construction | 103 | 260 | 520 | 363 | 780 | 0 | 0 |
| b. LERRD | 10 | 65 | 120 | 75 | 185 | 0 | 150 |
| c. Utility Relocation | 0 | 25 | 25 | 25 | 50 | NA | NA |
| d. Total | 113 | 350 | 665 | 463 | 1015 | 0 | 150 |

| | Harbor Improvement Increments | | | Illustrative Harbor Projects | | Inland Waterways | |
|---|---|---|---|---|---|---|---|
| | (1)<br>≤20' | (2)<br>>20'≤45' | (3)<br>>45' | (4)<br>Channel from 15' to 25' 1/ | (5)<br>Channel from 42' to 50' 2/ | (6)<br>Trust Fund Appropriations Authorized | (7)<br>No Trust Fund Authorization |
| 6. Non-Federal Contribution Over 30 Years 3/ | | | | | | | |
| a. Add'l 10% of Construction less credit for LERRD | 93 | 39 | 0 | 132 | 23 | NA | NA |
| 7. Total OMRR | | | | | | | |
| a. Project w/o Mitigation | 50 | 80 | 50 | 130 | 130 | 10 | 10 |
| b. F&W Mitigation | 10 | 10 | 10 | 20 | 20 | 10 | 10 |
| c. LERRD | 5 | 5 | 5 | 10 | 10 | 4 | 4 |
| d. Erosion or shoaling prevention | 3 | 6 | 6 | 9 | 12 | NA | NA |
| e. Total | 68 | 101 | 71 | 169 | 172 | 24 | 24 |
| 8. Non-Federal Contribution - OMRR | | | | | | | |
| a. Project w/o Mitigation | 0 | 0 | 25 | 0 | 25 | 0 | 0 |
| b. F&W Mitigation | 0 | 0 | 5 | 0 | 5 | 0 | 0 |
| c. LERRD | 5 | 5 | 5 | 10 | 10 | 0 | 4 |
| d. Erosion or shoaling | 3 | 6 | 6 | 9 | 12 | NA | NA |
| e. Total | 8 | 11 | 41 | 19 | 52 | 0 | 4 |

1/ For this illustration, the costs in column (1) are assumed to represent the cost of modifying the project from 15' to 20' and the costs in column (2) are assumed to represent the costs of modifying the project from 20' to 25'.

2/ For this illustration, the costs in column (2) are assumed to represent the cost of modifying the project from 42' to 45' and the costs in column (3) are assumed to represent the cost of modifying the project from 45' to 50'. Note that the costs in line 6a are not additive because of the formula for credit for LERRD: Line 6a = (0.10 x line 4a) - line 5b.

3/ See flood control examples for discussion of interest charges and 5-year recalculations that also apply to this repayment.

## FLOOD CONTROL COST SHARING
## EXAMPLES OF STRUCTURAL PROJECTS

| | CASE I<br>5% plus LERRD less than 25% | CASE II<br>5% plus LERRD equal to 25% | CASE III<br>5% plus LERRD between 25-30% | CASE IV<br>5% plus LERRD between 30-50% | CASE V<br>5% plus LERRD exceeds 50% |
|---|---|---|---|---|---|
| 1. Basic Project (w/o F&WL Mitigation) | | | | | |
| a. Construction | 850 | 740 | 700 | 570 | 380 |
| b. LERRD | 80 | 165 | 160 | 250 | 460 |
| c. Subtotal | 930 | 905 | 860 | 820 | 840 |
| 2. F&WL Mitigation | | | | | |
| a. Construction | 50 | 60 | 70 | 80 | 70 |
| b. LERRD | 20 | 35 | 70 | 100 | 90 |
| c. Subtotal | 70 | 95 | 140 | 180 | 160 |
| 3. Total Project | | | | | |
| a. Construction | 900 | 800 | 770 | 650 | 450 |
| b. LERRD | 100 | 200 | 230 | 350 | 550 |
| c. Total | 1000 | 1000 | 1000 | 1000 | 1000 |
| 4. Non-Federal Contribution - During Construction | | | | | |
| a. 5% cash | 50 | 50 | 50 | 50 | 50 |
| b. LERRD | 100 | 200 | 230 | 350 | 550 |
| c. Additional cash | 100 | 0 | 0 | 0 | 0 |
| d. Subtotal | 250 | 250 | 280 | 400 | 600 |
| e. Adjusted Non-Fed Share | 250 | 250 | 280 | 400* | 500* |
| - Cash | 150 | 50 | 50 | 50 | 50 |
| - Min. LERRD at Constr. | 100 | 200 | 230 | 250 | 250 |
| - Max. subj to Repymt** (Up to 15 yrs) | 0 | 0 | 0 | 100 | 200 |
| 5. Non-Federal Contribution - OMRR | | | | | |
| (All O&M Costs, Incl. Mitigation, Are Non-Federal) | | | | | |

* Because of the 30% option under Section 103(a)(4) and the 50% limit on the non-Federal contribution under Section 103(a)(3), the Corps of Engineers may be required to finance that portion of the accomplishment of LERRD that exceeds these amounts.

** Appropriate interest charges (including interest during the construction period) will be added to a deferred payment or to an amount repaid over a period of time. The interest rate shall be determined by the Secretary of the Treasury, taking into consideration the average market yields on outstanding marketable obligations of the United States with remaining periods of maturity of one year or equal to the reimbursement period, whichever is greater, during the month preceding the fiscal year in which costs for the construction of the project are first incurred plus a premium of one-eighth of one percentage point for transaction costs. Repayment contracts shall provide for recalculation of the interest rate at five-year intervals.

## FLOOD CONTROL COST SHARING
## EXAMPLES OF NONSTRUCTURAL PROJECTS

| | CASE I<br>abc's less than 25% | CASE II<br>abc's equal to 25% | CASE III<br>abc's exceed 25% |
|---|---|---|---|
| 1. Basic Project (w/o F&WL Mitigation) | | | |
| a. Construction | 850 | 690 | 380 |
| b. LERRD | 80 | 195 | 460 |
| c. Subtotal | 930 | 885 | 840 |
| 2. F&WL Mitigation | | | |
| a. Construction | 50 | 60 | 70 |
| b. LERRD | 20 | 55 | 90 |
| c. Subtotal | 70 | 115 | 160 |
| 3. Total Project | | | |
| a. Construction | 900 | 750 | 450 |
| b. LERRD | 100 | 250 | 550 |
| c. Total | 1000 | 1000 | 1000 |
| 4. Non-Federal Contribution - During Construction | | | |
| a. LERRD | 100 | 250 | 550 |
| b. Additional Contribution | 150 | 0 | 0 |
| c. Total | 250 | 250 | 550 |
| d. Adjusted Contribution | 250 | 250 | 250* |
| - Min. LERRD at Constr. | 100 | 250 | 250 |
| - Max. subj. to Repymt.** (Up to 15 yrs) | 150 | 0 | 0 |
| 5. Non-Federal Contribution - OMRR (All O&M Costs, Incl. Mitigation, Are Non-Federal) | | | |

* Since non-Federal contribution is limited to 25%, the Corps of Engineers will be required to finance the non-Federal accomplishment of LERRD that exceeds 25% (300) unless non-Federal interests are willing to accomplish the total LERRD and be subsequently reimbursed by the Corps.

** Interest (Section 106 rate) will be added to the amount repaid over time.

### OPERATION AND MAINTENANCE, GENERAL

Mr. DAWSON. Under "Operation and maintenance, general," the request is for $1.47 billion. It includes $149 million in appropriations from the newly established harbor maintenance trust fund and assumes that receipts into this fund will be upward of $149 million. Funding at this level permits the Corps to address priority operation and maintenance work.

### GENERAL INVESTIGATIONS

Under "General investigations," Public Law 99–662 provides for an approach to budgeting planning efforts which parallels that adopted for the civil works programs over the last several years. For those projects that have been subject to the discipline of study cost sharing, we have budgeted $1 million to initiate preconstruction engineering and design. This will allow for continued funding for up to six projects, presently unidentified, while their definite project reports are being reviewed within the executive branch and final recommendations are being formulated for submittal to Congress.

This emphasis on continuing the work and on responding to commitments, evolving from the reconnaissance and feasibility phases of project studies, has resulted in a creditable program and a budget request of $133 million. This approximates the total appropriated for fiscal year 1987. The associated nonfederal contribution will add another $10 million to the GI program.

### BUDGET PRINCIPLES AND PRIORITIES

We have had to establish principles and priorities in putting together the civil works budget. We are trying to achieve the greatest efficiences in terms of ongoing commitments and investment returns.

Under ongoing commitments, we have concentrated on translating the new cost-sharing rules into operational guidance and criteria which can be applied to individual new starts as they are funded. These policies are needed before we can proceed to negotiate the cooperative agreements for the fiscal year 1987 new starts and, in some cases, modify those agreements already in effect for the fiscal year 1985 new starts.

We are also concentrating on certain program initiatives contained in the 1986 authorizing act which require early attention. Included are a number of navigation provisions, such as the formation of the Inland Waterways Users Board, which is to advise us and the Congress on priorities for the construction and rehabilitation of the inland waterways system.

### FUNCTIONAL PRIORITIES

If I may, I would like to mention some functional priorities that we also have established. We are concentrating our resources on the traditional mission of flood control and commercial navigation. On those projects where their outputs are fully vendible, such as municipal and industrial water supply and hydropower generation—even if funded on a pay-as-you-go basis by the nonfederal sponsor—budgeting is contingent upon whether or not these outputs are provided in conjunction with the traditional outputs of navigation or flood control.

### COOPER RIVER SEISMIC MODIFICATION, SOUTH CAROLINA

Mr. Chairman, I want to urge this committee to support enactment of the rescission proposal on the Cooper River seismic modification project in the amount of $7,715,000. Modification of this dam should not be a federal responsibility. The South Carolina Public Service Authority, which built, owns, and operates the project, should entirely finance the construction costs through sales of hydropower.

Congress has until March 15 to act. If Congress does not act favorably on the rescission, it will still require additional funding in the amount of $12 million plus. The total estimated cost of the modification has risen to $20 million.

There is absolutely no basis on which to single out the South Carolina Public Service Authority for special treatment. Congress should as a minimum, in my opinion, require the project's owner to contribute the remaining $12 million for the completion of construction. This would at least support the principle of cost sharing, albeit very late in the game.

The reason we are so concerned about this project, Mr. Chairman, is the hundreds of nonfederal dams that are out there around the country. We feel this opens the door for federal responsibility where none has existed in the past at a time when we really do not have enough money to do the job that Congress has given us to do for traditional project purposes.

### BARBOURVILLE AND HARLAN PROJECTS, KENTUCKY

Another point, Mr. Chairman, is that while we are complying with the disposition of fiscal year 1987 funds appropriated by Congress for Barbourville and Harlan projects, we have not budgeted follow-on money. These projects, in our view, were inappropriately exempted in Public Law 99–662 from nonfederal cost sharing.

Like other elements of section 202 projects, Barbourville and Harlan not only lack the normal economic justification which typifies our projects; they also are not subject to the discipline of the new cost sharing which is designed to assure that future work is a realistic and cost-effective response to the flood problem.

We strongly urge the subcommittee not to continue to appropriate additional monies for Barbourville and Harlan.

### CROSS-FLORIDA BARGE CANAL, FLA.

Mr. Chairman, there is one additional item that I want to address in the context of functional priorities, and that is section 1114 of Public Law 99–662, which relates to the Cross-Florida Barge Canal project. We oppose most of this provision since it is inconsistent with our budget priorities and also represents an activity that should be accomplished by state or local interests.

We do not object to the deauthorization of the unconstructed portions of the project, if that is what the Congress decides. We strongly object, however, to spending $32 million, federal dollars, to purchase unused project land to establish a conservation management area. We believe that the establishment and management of such an area should be a nonfederal activity, particularly since nonfederal interests own the land in question.

We seek your support in not appropriating additional funds for that purpose.

### NEW START CRITERIA

To continue on with my earlier discussion on investment considerations, I need to touch on the criteria used to select new construction starts which we have submitted for your consideration. Each project had to meet two primary screening criteria: One, the project had to be ready, from an engingeering standpoint, to proceed into construction. Two, the project had to meet all the necessary environmental requirements, including authorized mitigation measures.

### CONCLUSION

I conclude, Mr. Chairman, with some key points. Financial constraints and the need to prioritize the work eligible to be funded preclude the undertaking of new, nontraditional programs and activities. This also requires a consistent application of cost sharing and financing principles under the act. We need your help to accomplish these goals. We need to avoid special treatment in the form of cost-sharing exemptions and exceptions. Consistency in the application and treatment of the cost-sharing and financing reforms is essential. Only then can we realize the credibility that cost sharing will bring to national water resources development.

The fiscal year 1988 program and budget shows strong support for the traditional project purposes of the Corps of Engineers and the avoidance of federal competition with private and nonfederal public sectors in the planning and developing of hydropower production, municipal and industrial water supply and recreational facilities.

We will continue our past policy of postponing low-priority work such as maintenance of low-use waterway segments or harbors and deferring work on those projects that no longer have good economics.

The change in the civil works programming and budget process, moreover, will be very helpful. Working within the framework of Public Law 99–662, we devised a system which will allow projects to move through the planning and construction phases without the delays that we have seen in the past. The local sponsors will be paying for the first time a significant part of not only the project construction itself, but also the planning, design, and study of the project.

This will eliminate in an early stage unproductive projects and, thus, as an integral part of our efforts with the Congress to give the civil works program the credibility necessary to enable it to compete effectively for budgetary resources.

This completes my statement, Mr. Chairman. What I would like to do as I close is mention five other people who have worked very hard to help us make our presentation to you and who work the year round to provide you the information and justification for our budget: Mr. Jim Maas, Mr. Larry Devick, Mr. Dave Kenyon, Mr. Steve Hudak, and Mr. Henry Pointon.

[The statement follows:]

## STATEMENT OF ROBERT K. DAWSON, ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

I am pleased to appear before your subcommittee today to present the Fiscal Year 1988 budget recommendations for the Civil Works Program of the Army Corps of Engineers. The Chief of Engineers, Lieutenant General E. R. Heiberg III, the Director of Civil Works, Major General Henry J. Hatch, and Mr. Don Cluff, Chief of Programs, are with me and will assist in the presentation of today's testimony. Also present, close at hand, are Mr. Steven Dola, my Deputy for Budget, Dr. G. Edward Dickey, my Deputy for Program Planning, and Dr. Bory Steinberg, Chief of Policy of the Corps.

This appearance is noteworthy in that it follows passage of the Water Resources Development Act of 1986, Public Law 99-662, which confirmed the reforms to the water resources program agreed to by the Congress and the Administration and incorporated by this subcommittee into the funding of the Fiscal Year 1985 and Fiscal Year 1987 new construction starts. Hopefully, the hiatus in project authorizations, spanning more than a decade, is now over, and we can once again concentrate all our resources on addressing the nation's water resource problems and opportunities. With the passage of this Act, Congress and the President have provided the nation's water program the direction it needs. I personally wish to acknowledge and thank this subcommittee for its leadership. Your steadfast commitment has provided us the opportunity to develop a strong, vibrant program. And, without your recognition of the budgetary realities and restraint on funding new construction starts, reform may have been, indeed, would have been, impossible to achieve.

My statement addresses these topics:

- o Fiscal Year 1988 Budget Request,
- o Budget Principles and Priorities, and
- o Proposed Legislation.

## FISCAL YEAR 1988 CIVIL WORKS BUDGET REQUEST

The budget for Fiscal Year 1988 continues the President's commitment to support responsible development of the nation's water resources. The program reflects a realistic balance between the objective of accommodating an increasing capital investment program of planning, engineering, and construction of new projects and the practical necessity of retaining an effective operation and maintenance program for those projects now in use.

The budget is best understood in relation to the following Public Law 99-662 reforms which it embodies:

- Enhanced non-federal cost sharing and financing of construction projects;
- New sources of revenues to fund harbor maintenance in the form of ad valorem fees to be collected under the newly enacted Harbor Maintenance Revenue Act; and
- Increased non-federal participation in project formulation and development through study cost sharing.

### Summary

The FY 1988 program totals $3.5 billion and is predicated on Federal appropriations of some $3.27 billion and associated non-federal contributions of $233 million. The Federal budget request, summarized by appropriation account in Table A, which is attached, includes the appropriation of some $187 million in receipts from two trust funds supporting the Civil Works Program: the Inland Waterways Trust fund and the Harbor Maintenance Trust Fund. Offsetting receipts that would be collected under existing law, $20.1 million, and under pending legislation, $19.2 million, would result in net Federal appropriations of $3.23 billion.

## Construction, General

This is a remarkably good budget request, considering the necessity for budget restraint, and could not have been accomplished without the reforms embodied in P.L. 99-662. Federal and non-federal investment in the projects and programs funded under the Construction, General, account total just over $1.4 billion. This is a significant milestone; such an investment level has not been programmed since Fiscal Year 1982. It includes funding of 60 construction projects started or scheduled to be started during the three year period, FY 1985 through FY 1987, and funds to initiate construction for up to 13 more projects in FY 1988. The name and costs of the FY 1988 recommended new construction starts are shown on Table B, which also is attached to this statement.

The key to sustaining such an investment level is the enhanced non-federal share of project costs and the financing of that share during construction. In FY 1985, the year when work on 36 of the 60 projects was first funded, contingent upon increased contributions from project sponsors, the required cash contributions from local interests totaled just under $50 million or only 5 percent of the Federal appropriation. Execution of the FY 1988 budget envisions cash contributions of some $221 million and the appropriation of some $38 million from the Inland Waterway Trust fund. Thus, appropriation of general funds actually will total $1.15 billion, with the non-federal share amounting to almost 23 percent of the general fund appropriations. And the level of non-federal contribution will continue to rise as the enhanced cost sharing provided for an P.L. 99-662 applies to a greater portion of the projects under construction.

## Operation and Maintenance, General

Under the reforms enacted in PL 99-662, the financing of operation and maintenance of all future projects, except those having costs associated with commercial navigation improvements, is a non-federal responsibility. Such provisions were incorporated in the Local Cooperation Agreements for the FY 1985 new construction starts. In the case of commercial harbors, a new source of revenue, receipts from an ad valorem fee, will be used to help fund up to 40 percent of their operation and maintenance costs. Therefore, the O&M

program can be expected to stabilize around the current level, with adjustments made principally to accommodate increases due to inflation, projects now under construction and scheduled to be operated as a Federal project, and the major rehabilitation of the older projects. Of the $1.47 billion Operation and Maintenance budget, it is anticipated that upward of $149 million in receipts will be available for appropriation from the newly established Harbor Maintenance Trust Fund.

Reforms in the general regulatory program over the last five years have yielded considerable savings through improved efficiency. For instance, the average permit evaluation processing time is now 78 days compared to 130 days in 1982. We need to maintain this quality and level of performance that we have worked so hard to achieve. The FY 1988 budget includes $55.3 million for the general regulatory program. Moreover, Mr. Chairman, this same amount of $55 million, which is $5 million more than is allocated in the report accompanying the Continuing Resolution, is needed in FY 1987. Accordingly, it is our intention to reprogram $5 million in available O&M funds in the current year. Without additional funds, we will experience increased application processing time, reduced coordination with others, delayed jurisdiction determinations, difficulties in complying with several legal mandates, and delays in environmental and other studies. These delays and impacts are anticipated largely because of personnel reductions which would be incurred without adequate funding. The regulatory program is very labor intensive so that we would have to cut our full time professional staff by 8% and eliminate most of our temporary and part time personnel.

Recent developments, such as more restrictions and procedural requirements on nationwide permits, jurisdiction over more isolated waters, expanded coordination concomitant with the new interagency agreements, and additional duties in controlling certain solid wastes, have added to the output requirements of our regulatory staffs. Increased construction activity in the private sector, apparently stimulated by lower interest rates and improved economic conditions, is also increasing the number of applications being submitted. Regional situations such as migratory bird provisions and Great Lakes flooding have required additional staff reviews. We have made greater use of general permits, especially those crafted on viable local or state regulatory programs to help us with a part of this surge in permit activity.

General Investigations

In the study program we are successfully implementing the two-phase study process provided for in Public Law 99-622. The new law, in fact, parallels the approach to planning adopted for the Civil Works Program over the last several years. There will be, first, a reconnaissance phase study conducted at full Federal expense to determine the likelihood that planning will result in a project which actually will be constructed. Second, should the project sponsor and Federal Government wish to proceed, there will be a feasibility phase study, equally cost shared, to establish the scope and cost of the project, as well as determine its engineering, economic and environmental feasibility. The project recommended in the Definite Project Report submitted to Congress for authorization certainly should be implementable: not only will the project have passed the usual tests of feasibility, but the sponsor, through study cost sharing, will have agreed on the desirability of the project.

Recovery of the non-federal share of the costs of preconstruction engineering and design is dependent upon initiation of project construction. The project sponsor pays his share of these costs along with his share of the other construction costs during the construction period. How fast planning and design of the project can proceed, however, is related to the technical and financial capabilities involved. This is a concern for both the sponsor and for us. And, because of this concern, we have modified our programming and budgeting process in order to minimize the funding and the time gaps for implementing projects.

For those projects that have been subject to the discipline of study cost sharing, we have budgeted $1 million under the General Investigations account to initiate preconstruction engineering and design. This will allow for continued funding for up to six projects while the Definite Project Reports are being reviewed within the Executive Branch and final recommendations are being formulated for submittal to Congress. Continuity in the partnership arrangements will be contingent upon favorable action and agreement at each of the project review checkpoints. We also have budgeted an additional $3.7 million to initiate the preconstruction engineering and design of 8 more projects for which the feasibility phase has already been completed.

This emphasis on continuing the work, and on responding to the commitments, evolving from both the reconnaissance and feasibility phases of project studies has resulted in a creditable program and a budget request of $133 million for the General Investigations account. This approximates the total appropriated for Fiscal Year 1987. The associated non-federal contribution will add another $10 million to the program.

## BUDGET PRINCIPLES AND PRIORITIES

While the enhanced cost sharing and financing provisions of PL 99-662 have enabled us to spread the Federal dollar over more studies, projects and activities, the fiscal realities of the budget deficit have limited the availability of additional funds for the Civil Works program. Accordingly we have had to establish principles and priorities for developing a program that achieves the greatest efficiencies in terms of ongoing commitments and investment returns.

### Ongoing Commitments

An immediate priority is early implementation of cost sharing contracts for the new construction starts approved since FY 1985. We have concentrated on translating the new cost sharing rules into operational guidance and criteria which can be applied to individual new starts as they are funded. These policies are needed before we can proceed to negotiate the Cooperative Agreements for the FY 1987 new starts and, in some cases, modify those agreements already in effect for the FY 1985 new starts.

We are also concentrating on certain program initiatives contained in the 1986 Authorizing Act which require early attention. Included are a number of navigation provisions, including the formation of the Inland Waterways Users Board, which is to advise the Secretary of the Army and the Congress regarding priorities for construction and rehabilitation of the inland waterways system. Then, too, there is the need to establish policy concerning credits for construction activities by local sponsors and procedures for non-federal implementation of Federal flood control and commercial navigation works. The numerous environmental provisions are being addressed by a special task force representing a broad cross section of our organization. Finally, we have undertaken a systematic review of each of the project authorization provisions to identify the appropriate response in the case of individual project authorizations. Some of these decisions are reflected in this year's budget; others will be reflected in the budget in subsequent years as resources and priorities permit.

## Functional Priorities

We are concentrating our resources on the traditional mission of flood control and commercial navigation. Providing fully vendible outputs of municipal and industrial water supply and hydropower generation, even if funded on a pay-as-you-go basis by the non-federal sponsor, is contingent upon providing those services in conjunction with the traditional outputs.

Funding limitations also warrant assigning recreation a lower priority and deferring recreational investments whenever there are more pressing demands to be met. It is the Administration's intent to reduce Federal competition with the private and non-federal public sectors in providing recreation opportunities. It is our intent to cost share only those facilities that satisfy the basic needs of the public who want to enjoy the recreational opportunity provided by the Federal project. Accordingly, Federal funds are to be used to support development of recreation facilities only when the recreation benefits are less than 50 percent of the total benefits and the recreation potential for those benefits are either created by projects formulated and justified for other purposes or when the recreational benefits are produced as the result of investment for other project benefits; for example, recreation benefits produced by a breakwater for commercial navigation.

Another aspect of our policy is to allow non-federal local sponsors (state, county or city agencies) to enter into a third party agreement for the development of needed recreation facilities. A most recent example of this has occurred at the Corps' Patoka Lake, Indiana, project. There, the Indiana Department of Natural Resources has selected an investment group to finance and build a $70 million, 1,800 acre recreation resort. The project land is being sub-leased from the State. It is estimated that the project will create 1,700 to 2,500 new jobs.

At the same time, we are looking closely at policies governing the investments in flood control projects which encourage the increased production of "surplus crops", that is, crops directly involved in agricultural price support programs. Planning for investments to increase production of such crops is, for the short term at least, inconsistent with current Federal programs to take land out of production and/or reduce Federal outlays in support of these crops.

And, finally, we also are curtailing or deferring those maintenance activities which can be delayed without critical operational or economic consequences. Such programming actions involving low priority work are consistent with this subcommittees action on the FY 1987 budget.

## Investment Considerations

In selecting new construction starts, each project had to meet a variety of tests. First, the project had to be ready from an engineering standpoint so that, if in fact it were funded, construction could be initiated within the budget year. Second, the project had to meet all the necessary environmental requirements including authorized mitigation measures. Third, the project has to enjoy the support of local sponsor(s), who would be able to meet the new cost sharing requirements. Fourth, the project had to be in accord with our priority outputs, which, as I indicated, are essentially navigation and flood control. And, of course, the project has to have substantial economic returns, that is, it has to have a healthy benefit cost ratio. Ultimately, these criteria are looked at in combination, and a list of projects which can be accommodated within the available funds is selected. The list of projects recommended for FY 1988 best meets the criteria that I have outlined.

In evaluating the economic worth of a project, the benefit cost ratio was computed based on the average market yield for outstanding, comparatively long-term obligations of the U.S. Treasury. For the FY 1988 new starts, the discount rate was 8 7/8 percent. However, the projects we have recommended as new construction starts have a higher rate of return. The benefits of the selected projects exceed their costs, exclusive of recreational considerations, based on a 10 percent rate of return, the yield which can be realized from alternative investments in the private sector.

## PROPOSED LEGISLATION

### Harbor Maintenance

With the newly enacted Harbor Maintenance Trust Fund in place, it is estimated that, by the close of Fiscal Year 1987, some $66.8 million will have been collected and accrued in the trust fund. By law, these funds should be used to finance the maintenance work accomplished at commercial harbors and reduce the amount required from the general fund of the Treasury. Accordingly, a Fiscal Year 1987 supplemental request to appropriate the receipts from the Trust Fund as they become available has been submitted by the President for Fiscal Year 1987.

As you know, the Secretary of Treasury is responsible for implementing the Harbor Maintenance Trust Fund legislation. However, we are working closely with the United States Customs Service which is developing the implementing regulations on behalf of the Treasury Department. Interim regulations are scheduled to be in place by March 1, 1987, and final regulations are scheduled to be in place by April 1, 1987. In this connection, Mr. Chairman, we have been working with them to establish guidelines and to set up the mechanics of collecting the necessary waterborne commerce data to serve as a basis for collection and enforcement of the value tax to be levied on commercial cargo.

We anticipate that additional programming and processing will be necessary to provide Customs with data in a usable format and a reasonable timeframe. While assuming this new responsibility, we need to maintain our ability to continue the collection and compilation of statistics on the waterborne commerce of the United States which also are used to determine the proper support for completed projects and to aid in developing projections for proposed improvements. The FY 1988 budget includes $3.5 million for this work. This is an increase of $450,000 over that which is required in FY 1987. The increase is necessary to develop a new state-of-the art computer software system to enable computers to accomplish much of the work currently being done by personnel. After development is complete in FY 1989, we expect furture budgets to return to past levels. The report accompanying the Continuing Resolution included $2.5 million, which is $522,000 less than what is needed in FY 1987. Therefore, it is our intention, Mr. Chairman, to reprogram available O&M funds in the amount of $522,000 to the Waterborne Commercial Statistics Program in the current year.

Legislation also is being prepared by the Department of Transportation to restore the direct use of the collected tolls to fund the operation and maintenance of the Saint Lawrence Seaway rather than have the tolls deposited into, and then appropriated out of, the Harbor Maintenance Trust fund as the Harbor Maintenance Revenue Act of 1986 now requires. Rebates to shippers, as authorized in P.L. 99-662, would continue to be paid out of the Harbor Maintenance Trust Fund.

## Recreation User Fees

We are resubmitting a legislative proposal that would expand our authority to collect fees for the use of project recreation lands and facilities. The current fee program is limited to the collection of fees for specialized recreation services or facilities (e.g. campgrounds). The Corps is currently prohibited from collecting entrance or admission fees by Section 210 of Public law 90-483. Public law 93-303 limits the Corps to collection of fees for use of highly developed campgrounds and further provides that one free campground will be provided at each project where camping is permitted. The proposal would eliminate these restrictions and would place the Corps on a comparable basis with other agencies concerning the collection of recreation use fees.

## Employee Costs

A second supplemental to the FY 1987 appropriation also has been submitted as part of the President's budget. Enactment of the new Federal Employee Retirement System and the Federal employee pay raise resulted in a combined increase to our operating costs of $37.6 million in FY 1987. Review of our FY 1987 program indicated the ability to absorb all of the increase. However, authority is being sought to transfer $3.2 million from the appropriations for the Construction, General, account to the General Expenses account where there is a shortfall which cannot be met within available funds.

## Rescission

The President has submitted legislation to rescind the funds and eliminate the legislative directive to upgrade and repair a privately-owned hydroelectric dam which is not a Federal responsibility. Actions to correct any deficiency so as to maintain the project's Federal license should be financed by the dam's owners and recovered through the sales of hydropower, as is the case with all other Federally licensed hydropower facilities.

## CONCLUSION

Financial constraints and the need to prioritize the work eligible to be funded preclude the undertaking of new, non-traditional programs and activities. This also requires a consistent application of the cost sharing and financing principles of the Authorizing Act. We need your help to accomplish these goals. We need to avoid the directives that require us to repair deficiencies that, by law, are the responsibility of others— the relocation of a roadway or bridge outside the boundaries of a Corps reservoir is an example of such a directive.

Nor should we be the speculative developer, trying to provide a catalyst for future regional growth when realistic economics indicate such projects are not cost effective. Examples of such developments include the Red River Waterway project and funding the construction of what essentially are single-purpose water supply projects in areas where other reservoirs exist with surplus, unsold storage.

Equally important, we need to avoid special treatment in the form of cost sharing exemptions and exceptions. Consistency in the application and treatment of the cost sharing and financing reforms is essential. Only then will we realize the credibility that cost sharing will bring to national water resources development.

The FY 1988 program and budget show strong support for the traditional project purposes of the Corps of Engineers. They continue the practice of using the principle of high return on investment as a major determinant for new work. The new starts that you will see in the budget were selected, in a large part, based on the fact that their benefits — the benefits that will come back to the taxpayers — far exceed the cost of those projects. The budget also provides for continued construction funding for those FY 1985 and FY 1987 new construction projects for which signed Local Cooperation Agreement are forthcoming. It also reflects a new budget process designed to ensure the continuity of work on marketable projects and to ensure the early identification of projects which cannot be supported by the Corps or the project sponsor. The unsupportable projects are the ones we need to stop in order to minimize Federal expenditures as early as possible. How do we do that? We avoid Federal competition with the private and non-federal public sectors in the planning and developing of hydropower production, municipal and industrial water supply and recreational facilities. We also continue our past policy of postponing low priority work such as maintenance of low use waterway segments and/or harbors and deferring work on those projects that no longer have good economics.

The change in the Civil Works programming and budgeting process, moreover, will be very helpful. Working within the framework of Public Law 99-662, we have devised a system which will allow projects to move through the planning and construction phases without the delays that we have seen in the past.

We anticipate that there will be an effective screening of projects appropriate to each phase of the planning and review process. This anticipation is based upon the fact that the project sponsor will be involved in the preparation of plans for the project. The local sponsors will be paying, for the first time, a significant part of not only the project itself — the construction — but also the planning, the design, and the study of the projects. This will eliminate, at an early stage, unproductive projects, and thus, is an integral part of our efforts with the Congress to give the Civil Works Program the credibility necessary to enable it to compete effectively for scarce budgetary resources.

This completes my statement, Mr. Chairman.

## TABLE A
## DEPARTMENT OF THE ARMY
## CORPS OF ENGINEERS - CIVIL WORKS
## FY 1988 CIVIL WORKS PROGRAM
## (DOLLARS IN THOUSANDS)

| | FEDERAL FUNDS | | | | NON-FEDERAL FUNDS | | | |
|---|---|---|---|---|---|---|---|---|
| | TRUST FUNDS | | | | RIVER AND HARBOR CONTRIBUTED FUND a/ | | | |
| APPROPRIATION TITLE | INLAND WATERWAY | HARBOR MAINTENANCE | GENERAL FUNDS | TOTAL FEDERAL BUDGET REQUEST | AUTHORIZED | ANCILLIARY | TOTAL | TOTAL PROGRAM FUNDING |
| GENERAL INVESTIGATIONS | - | - | 133,000 | 133,000 | 10,000 | - | 10,000 | 143,000 |
| CONSTRUCTION, GENERAL | 38,000 | - | 1,150,000 | 1,188,000 | 221,000 | 15,000 | 236,000 | 1,424,000 |
| OPERATION & MAINT., GEN | - | 149,200 | 1,320,800 | 1,470,000 b/ | - | 2,000 | 2,000 | 1,472,000 |
| FLOOD CONTROL, MR&T | - | - | 317,000 | 317,000 | 2,000 | - | 2,000 | 319,000 |
| GENERAL EXPENSES | - | - | 128,200 | 128,200 | - | - | - | 128,200 |
| FLOOD CTRL. & COASTAL EMERG | - | - | 26,000 | 26,000 | - | - | - | 26,000 |
| REVOLVING FUND | - | - | - | - | - | - | - | - |
| PERMANENT APPROP. | - | - | 9,000 | 9,000 | - | - | - | 9,000 |
| TOTAL | 38,000 | 149,200 | 3,084,000 | 3,271,200 | 233,000 | 17,000 | 250,000 | 3,521,200 |
| OFFSETTING RECEIPTS | | | | | | | | |
| UNDER EXISTING LAW | - | - | 20,100 | 20,100 | | | | |
| PROPOSED LEGISLATION c/ | - | - | 19,200 | 19,200 | | | | |
| NET TOTAL | 38,000 | 149,200 | 3,044,700 | 3,231,900 | | | | |

a/ Authorized - The non-Federal cash contribution required under terms of existing and proposed agreements.
Ancilliary - Estimated cost of unauthorized work requested by non-Federal interests and done on a reimbursable basis.

b/ Includes $12.0 million to be derived from the Special Recreation Use Fee account.

c/ Increased recreation user-fees.

TABLE B
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS - CIVIL WORKS
FY 1988 RECOMMENDED NEW CONSTRUCTION STARTS
(Dollars in Millions)

| PROJECT TYPE/NAME | STATE | FY 1988 BUDGET REQUEST | TOTAL FIRST COST | FINANCING | |
|---|---|---|---|---|---|
| | | | | FEDERAL | LOCAL |
| FLOOD CONTROL | | | | | |
| Alamogordo | NM | 2.00 | 27.20 | 20.40 | 6.80 |
| Mingo Creek | OK | 2.40 | 131.00 | 80.90 | 50.10 |
| North Branch Chicago River | IL | 2.00 | 24.90 | 16.70 | 8.20 |
| Oates Creek, Richmond County | GA | 0.40 | 15.64 | 7.94 | 7.70 |
| Puerco River at Gallup | NM | 0.76 | 7.30 | 5.50 | 1.80 |
| Reno Beach Howard Farms Area | OH | 1.18 | 7.41 | 5.56 | 1.85 |
| Rio Grande Floodway, Truth or Consequences Unit | NM | 0.70 | 16.00 | 12.00 | 4.00 |
| State Road and Ebner Coulees | WI | 3.20 | 35.06 | 26.30 | 8.76 |
| Westerly Creek | CO | 0.70 | 11.77 | 8.83 | 2.94 |
| SUBTOTAL FOR 9 PROJECTS | | 13.34 | 276.28 | 184.13 | 92.15 |
| COMMERCIAL PORTS | | | | | |
| Charleston Harbor | SC | 8.00 | 88.50 | 64.88 | 23.62 |
| Manatee Harbor | FL | 2.40 | 21.57 | 9.45 | 12.12 |
| Oakland Inner Harbor | CA | 3.80 | 31.20 | 19.20 | 12.00 |
| Richmond Harbor | CA | 0.90 | 26.80 | 20.10 | 6.70 |
| SUBTOTAL FOR 4 PROJECTS | | 15.10 | 168.07 | 113.63 | 54.44 |
| TOTAL FOR 13 PROJECTS | | 28.44 | 444.35 | 297.76 | 146.59 |
| AS PERCENT OF TOTAL FIRST COST | | | 100.00 | 67.01 | 32.99 |

## STATEMENT OF LT. GEN. E.R. HEIBERG, CHIEF OF ENGINEERS

### FISCAL YEAR 1988 PROGRAM

Senator JOHNSTON. Thank you.

General Heiberg?

General HEIBERG. Thank you, sir.

With your permission, I will briefly highlight those areas of our budget request that are being emphasized through increased funding over last year's appropriation.

Overall, our request of $3.27 billion is about $140 million greater than the fiscal year 1987 appropriation. It includes funding to meet our program commitments for building to last year's appropriations and new start proposals for the budget year. These include the local cooperation agreements for our ongoing studies and construction projects; the operation and maintenance of existing and recently completed Corps projects; initiation of the recommended new study and construction starts; and lastly, increases for selected programs.

Program funding within the "General investigations" account is about the same as appropriated for fiscal year 1987. The budget requests for AE&D and CP&E, familiar terms to this committee, have been replaced with a new budgetary category: preconstruction, engineering and design, or PED. In effect, we are funding the preconstruction, engineering and design as a continuation of the feasibility phase, thereby working with project sponsors to minimize project delays due to the budgetary process. This means funding projects even as the executive branch reviews project reports or formulates recommendations to the Congress for construction authorization.

### FLOOD PLAN MANAGEMENT PROGRAM

Also included under the "General investigations" account are increases for flood plain management, collection and study of basic data, and research and development programs.

The flood plain management program is important to local interests. It alerts land-use decisionmakers to potential flood hazards before they commit both public and private funds to develop within the flood plain. The $2.9 million increase lets us provide a responsive level of service to those who depend on our technical expertise.

### COLLECTION AND STUDY OF BASIC DATA

Our request for the collection and study of basic data is an increase of about $1.5 million. The increase will fund the Corps' participation in an international joint commission study in an effort to see what can be done on the long-term basis to alleviate the adverse consequences of the high fluctuating levels on the Great Lakes. The need for such a study is supported by both the United States and Canadian governments.

## RESEARCH AND DEVELOPMENT PROGRAM

Finally, our request for research and development includes an increase of $3.5 million. The R&D program is important to all phases of our work, extending from the study stage through to the construction stage and on to operations. If we can reduce how much it costs to construct, operate and maintain projects, then we can recommend more new starts within our obligation and expenditure ceilings. Not only does the federal government and project sponsor benefit from the lower investment costs, but so does the private sector through a transfer of knowledge and technology initiatives.

The investment also allows us to answer questions with authorities that often keeps us on the right side of court. As you may know, we are challenged frequently in courts. As we speak here, there are about 600 cases in federal district courts today.

## CONSTRUCTION, GENERAL

Program funding for "Construction, general," account has been increased by $51 million over last year's program. This includes federal appropriations and associated nonfederal contributions. The federal appropriations from the Treasury's general fund and the inland waterways trust fund will only increase by some $27 million, even though we are asking for funds to initiate 13 new construction starts. The key here is the increase in the associated nonfederal contributions.

## CONSTRUCTION OBLIGATION CEILING

This construction request can be executed within the obligation ceiling for fiscal year 1988, as set forth in the new authorizing law. The total is $120 million less than the $1.5 billion ceiling. Of course, we will be monitoring the advertisement and award of all significant contracts and we will stay within the ceiling on the obligation of construction funds.

## MEETING THE CHALLENGE

For the past 5 years, the same Corps that has executed this nation's vital water resources program was also called upon to execute a huge catchup military construction program for both the U.S. Army and Air Force. The Corps has not been so challenged in terms of equivalent dollars since 1951. We met that challenge by executing both programs with the smallest number of employees on our payroll since before World War II. That broad capability has been kept sharp doing vital water resources work with this committee, and stands its nation in good stead.

One concern we now have as we start work on the projects of the near future is that the geographical distribution of new work authorized by the Water Resources Development Act of 1986 will not be uniform. A rational distribution, taking into account the work that may result within the next 5 to 10 years from the authorizing act, will probably require changes in how we operate.

We are looking in particular at the alternative of expanding the use of both regional and national centers when specialized expertise is needed for unique planning and design activities. In this way, we can concentrate our workload to help provide the work environment and challenge to ensure our being able to attain the best of our professional capabilities. We need this management flexibility if we are to receive the two primary objectives of this organization: quality engineering services and the efficient use of public resources.

### SUPPORT FOR COST SHARING

In closing, I would like to point out that the U.S. Senate voted for Public Law 99–662 by 84 to 2. A ringing endorsement also came from the House of Representatives. A basic tenet of the law is a rational and understandable set of cost-sharing rules. However, we already are beginning to hear that exceptions to the law may be needed. I fear those exceptions, because if they are written into law, they will put the program at risk with the President's strong support of the broad cost-sharing agreement supported in that water development bill that took so long in coming.

### RETURN ON INVESTMENT

I offer one challenge to this committee and to the 100th Congress, and that is to continue support of that cost sharing. Perhaps after a few years' experience, some fine tuning may be needed. But until then, I would strongly recommend against exceptions.

Mr. Chairman, last summer I was deeply concerned over the question and the difficulty in passing a new law, one that the President can sign. I had the feeling, as Chief of the Corps, that we were living on past glories in water resources. Do not get me wrong; that has been a proud half century that we have had.

In fiscal year 1986 we prevented $27 billion worth of flood damages. That is from a 50-year investment of $20 billion. That is an amazing story in itself, particularly when you include the lives that were undoubtedly saved and the lives that were made better by those good flood projects that we put into place in this country over the past half century and more.

### CONCLUSION

Now, Public Law 99–662 rejuvenates water resources in both Houses of Congress and the administration. I quickly say to you that Secretary Dawson was a section marcher on the administration side. We all take pride in this rejuvenation.

Sir, that concludes my statement and, together with Secretary Dawson, we will be pleased to respond to any questions you might have.

Senator JOHNSTON. Thank you very much, General Heiberg.

[The statement follows:]

## STATEMENT OF LT. GEN. E.R. HEIBERG III, CHIEF OF ENGINEERS

Like Assistant Secretary Dawson, I am optimistic about the future of the Civil Works program. Passage of the Water Resources Act of 1986, Public Law 99-662, gives us the opportunity to develop a strong partnership with the sponsors of our studies and construction projects. Getting to this position has not been easy. We have faced over a decade of stagnation, while the framework for change was being developed. We now have a lot of hard work ahead of us to get the various provisions of the Act quickly and fairly implemented.

The Assistant Secretary has focused on the cost sharing and financial requirements of PL 99-662 and the functional and budgetary priorities which have been used to develop our Fiscal Year (FY) 1988 program and budget request. I will focus on:

- The highlights of the major appropriation accounts.
- The importance of our research and development program,
- The Corps' contribution to the Gross National Product and this Nation's strengths, and
- Some organizational opportunities.

## FISCAL YEAR 1988 BUDGET REQUEST

### OVERVIEW

### Perspective

Overall, the FY 1988 request for Federal funds is within $140 million of the FY 1987 appropriations, an increase of 5%. Most of that, some $88 million, is attributable to passage of the new Federal Employees Retirement System and the FY 1987 pay raise. The balance, $52 million, is allocated among the major appropriation accounts and reflects allowances for new starts, in the case of the construction program, and minor allowances for inflation. What is different from the FY 1987 appropriation is the emphasis in the funding of certain programs or activities within the various appropriation accounts, and the need to meet our program commitments resulting from last year's appropriations and the local cooperation agreements for our ongoing studies and construction projects.

Summary

The budget request includes the Federal appropriation of \$3.08 billion in general funds and up to some \$190 million of trust fund receipts together with an associated \$233 million in non-federal funds in order to implement the proposed program in FY 1988. An additional \$17 million in non-federal contributions is expected to fund the reimbursable work we normally undertake as an adjunct to our regular program. Detailed information on the program highlights follow. A table summarizing the funding levels of the individual appropriation titles for the period FY 1986 - 1988 inclusive is attached for the Subcommittee's reference.

## GENERAL INVESTIGATIONS

### Request

The budget request of \$133 million for the General Investigations account is some \$6 million more than that requested in FY 1987. It also anticipates an additional non-federal contribution of \$10 million, for the feasibility phase study program, basically the same contribution as last year.

### Study Program

The request for the study program includes funds to initiate 16 new reconnaissance phase studies, an increase over last year's budget. Nevertheless, funding emphasis within the study program is on the completion and the review and approval of those reconnaissance studies funded in both FY 1987 and FY 1988, with an objective to get more feasibility phase studies started and more non-federal participation in the survey program. These feasibility phase studies provide the basis for our future construction program since the only way we can have new construction starts is through a timely and responsible survey program. The future of the Corps of Engineers is in a program, that is administered in an efficient, creditable way, reflective of the new partnerships with the non-federal sponsors.

## Preconstruction Engineering and Design

The budget request for the "Preconstruction, Engineering, and Design" program (which now includes the old AE&D, and CP&E programs) is essentially the same as that appropriated in FY 1987. With this program, we plan for projects to move from the feasibility phase into the Preconstruction Engineering and Design stage as swiftly as possible, funding those projects even as the Definite Project Report is being reviewed for submittal to the Congress for authorization of construction. Funding for the project will continue unless:

- o The Definite Project Report fails to receive approval (Federal or sponsor) at the key project review and approval milestones, or
- o The project is not funded by an appropriations act, or
- o The project is not included in the next authorization act following submittal of the Detailed Project Report to Congress, or
- o If support by sponsor for a new construction start is not forthcoming for whatever reason.

This change in the budgetary process will minimize the funding and time gaps that heretofore have hindered the implementation of a project and enhance our working relationships with the project sponsors.

## Other Program Changes

Funding has been increased over that previously appropriated for the Flood Plain Management, Collection and Study of Basic Data, and the Research and Development programs. The budget includes some $9.2 million for the Flood Plain Management program, a request which permits us to provide a more responsive level of service to those who depend on our technical expertise. This program is important because it alerts land use decision makers to potential flood hazards before they commit public and private funds to developments within the floodplain. In FY 1986 alone, we responded to over 82,000 requests for information on potential flood improvements and developments valued at $10 billion. I believe this program, even as it serves our citizens, results in later savings far beyond the dollars we invest. Those savings are, in major part, Federal savings as we avoid both the disaster recovery and tax loss drains on the federal budget of future years.

The request for the Collection and Study of Basic Data program is some $1.5 million over the FY 1987 appropriation level. The increase is required to fund the Corps' participation in an International Joint Commission study in an effort to determine what can be done on a long term basis to alleviate the adverse consequences of the fluctuating levels on the Great Lakes. The need for such a study is supported by both the United States and Canadian governments. Currently, and for the short term, the only practical way to battle the problem of high water is to continue the emergency procedures and methods being taken by the Corps, and for the states and local agencies to use the emergency plans that they have adopted.

And, finally, the request for the General Investigations portion of our Research and Development program has been increased by $3.5 million over that appropriated in FY 1987. This program is important to almost all phases of our work - extending from the study stage through to the construction stage. The technical benefits are significant enough that I will expand on the worth of this program later on in my testimony.

## CONSTRUCTION, GENERAL

### Program Requirement

As has been pointed out, the Federal request together with the non-federal contribution for the Construction, General account is the largest funding level requested by the Administration since FY 1982. Nevertheless, the overall program funding is within $51 million of the combined FY 1987 Federal appropriations and the associated non-federal share. While the non-federal share including the appropriation from the Inland Waterways Trust Fund of the overall funding level has increased by 10 percent, the increase in the general fund appropriation request totals slightly over two percent even though we are recommending the initiation of 13 new construction starts in FY 1988. Key to the lesser increase in Federal funding is the fact that while the budget requests for the FY 1985 and FY 1987 new starts reflect the current financial plans and commitments for those projects, we have estimated a higher than normal savings and slippage to reflect an expected delay in the award of contracts and a reduction in construction expenditures. As Mr. Dawson has stated, we have been developing guidelines and criteria for implementing the cost sharing and financial provisions of PL 99-662. This has proved to be more difficult than we anticipated. Hence, we need additional time to complete the negotiations for the FY 1987 local cooperation agreements and to determine if there will be need to modify the existing agreements for the FY 1985 new starts.

### Obligation Ceiling

The proposed program can be executed within the Obligation Ceiling included in PL 99-662. If we are successful in obligating all of the FY 1988 budget requests for the Construction, General, account of $1.188 billion and the $194 million construction component of the Flood Control, Mississippi River and Tributaries, account, together with an projected unobligated carryover of $108 million for both accounts, the obligations would total some $1.49 billion or some $10 million less than the obligation ceiling of $1.5 billion for FY 1988.

We will be monitoring the advertisement and award of all significant contracts. I will stay within the ceiling on the obligation of construction funds. Currently, the federal share of Construction, General, funding totals some 84%, but is expected to reduce down to the 70 - 75% level over time. This reduction in federal funding, coupled with the annual increase of $100 million in the obligation ceiling, should permit the maintenance of a responsive new starts program, given the low inflation rate now being experienced.

## OPERATIONS AND MAINTENANCE, General

### Funding

The budget request for the operations and maintenance of our projects totals $1.47 billion, of which $12 million is to be appropriated from the Special Recreation Use Fee account and $149.2 million in estimated receipts that should be available from the Harbor Maintenance Trust fund. After deduction of $43 million in allowances for the FY 1987 pay raise and the Federal Employee Retirement System, the FY 1988 budget request is some $37 million, or less than 3%, over the appropriation level for FY 1987 and is reflective of the financial restraint imposed on our program last year when the FY 1987 appropriations were some $30 million less than our budget request.

## The Program

The FY 1988 budget request meets all our priority funding requirements. Five waterway projects (or segments thereof), will continue to be maintained in a caretaker status. These marginal projects (with locks) include: the Pearl River, MS, the Savannah River Below Augusta, GA, the Dismal Swamp Route of the Atlantic Intercoastal Waterway in Virginia, the Inland Route, MI, and the lock operations on the Cross Florida Barge Canal, FL. As you know, the Kentucky River, Locks 5 through 14, previously included in our caretaker program, are now being operated by the Commonwealth of Kentucky. Similarly, the State of Wisconsin has now taken over operation and maintenance of the navigable portion of the Fox River project.

## FLOOD CONTROL, MISSISSIPPI RIVER AND TRIBUTARIES

### Budget Request

The FY 1988 budget request for the Flood Control, Mississippi River and Tributaries program is $317 million, together with an associated $2 million in non-federal contributions. Of the $317 million budgeted request, $6 million is for general investigations, $194 million is for construction, general, and $117 million is for operations and maintenance. Funding for both the survey and the preconstruction engineering and design programs as well as the construction program continue essentially at the same level as that previously appropriated. No new construction starts are proposed at this time, but funding is included for the engineering and design of one of the FY 1985 Supplemental new starts, and land acquisition for the other new start.

The maintenance portion of the budget request is greater than the FY 1987 appropriation amount. This increase of $6 million will be used to fund additional levee setback work to preserve the integrity of the Mississippi River Levee System and for the construction of some dikes to maintain the flood control protection and navigation dependability along the Mississippi River.

## GENERAL EXPENSES

An appropriation of some $128.2 million is being sought to fund the executive direction and management of the Civil Works program. The request is equivalent to the FY 1985 and FY 1987 funding levels except for several cost adjustments that we have no control over and a one-time cost of doing business increase. Specifically, these adjustments include:

- o $4.5 million in personnel costs to cover anticipated employer contributions under the new Federal Employee Retirement System and the January 1987 pay raise,
- o $1.0 million increase in the Standard Level User Charge (SLUC) projected by the General Service Administration (GSA),
- o $1.1 million for the GSA mandated purchase of telephone equipment used in the Federal Telecommunications system (FTS), along with the conversion of FTS costs within the Corps from assigned personnel strength to actual usage, and,
- o A one-time cost of $2.9 million for computer software conversion in connection with the Congressionally authorized Corps of Engineers Automation Plan (CEAP).

## REVOLVING FUND

No new budget authority is being requested in FY 1988 because the two continuing major items — replacement of a dust pan dredge, and the Corps of Engineers Automation Plan (CEAP) — have both experienced some slippage. With additional slippage anticipated, our FY88 program can be accomplished within funds already appropriated and available for expenditure.

For your information we are proposing to use some $7.4 million from the corpus or the self liquidating fund to acquire four other new major items under our Plant Replacement and Improvement Program. These four major items are:

- o Galveston District office building
- o Laboratory for the Ohio River Division
- o Launch "MOORE" replacement for St. Louis District
- o Flat deck spud barge for Nashville District

## RESEARCH AND DEVELOPMENT PROGRAM

### PRIORITY

In the President's budget message to Congress he outlined as one of his program priorities the restoration of America's competitiveness through the support for basic research. I quote "Support for basic research . . . is a key factor in generating sufficient new knowledge to ensure continued technological innovation. The Federal Government traditionally has assumed a key role in the support of basic research, because the private sector has insufficient incentives to invest in this area."

I believe the same point can be made about applied research in the area of water resource development. The Army Corps of Engineers has always taken a lead in developing better and more efficient ways of constructing, operating and maintaining, assessing and evaluating environmental impacts, and developing methods to investigate water resources needs. In this Nation, we have that very special expertise we have developed over the past 5 1/2 decades since we established the famed Waterways Experiment Station in Mississippi.

### VALUE

Research of this type is a key factor in our being able to maintain a viable new construction start program during times of budgetary constraints. If we can reduce how much it costs to construct, operate and maintain projects, then we can recommend more new starts within our obligation and expenditure ceilings. That is a straight forward reason. Not only does the federal government and project sponsor benefit from the lower investment costs, but so does the private sector through our transfer of knowledge and technology initiatives. We recognize that knowledge generated through our research and development programs is of little use to our nation's private sector unless this knowledge is made available to them. Therefore, we encourage our scientists and engineers to attend conferences, workshops, and to publish and distribute the results of our research and sometimes execute selected demonstration projects. And through our scientist and engineer exchange program, we transfer knowledge between the Federal government and states.

Examples of the technical benefits realized are many but for, summary sake, I would like to highlight four basic categories that are meaningful to our program.

- o Greater reliability with respect to performance and safety - reducing the potential for catastrophic failures.
- o Improved understanding of construction materials and techniques which translates to material specifications and testing techniques and, in turn, safer, more economical and durable structures.
- o Design criteria and guidance for improved construction techniques including placement of materials.
- o Fills in the gaps where there is a lack of knowledge, information, or design guidance including the development of simulation or modeling techniques.

NEED

Today, because of the increasing age of more and more of our structures and facilities, greater emphasis is being placed on research and development concerning the repair, evaluation, maintenance, and rehabilitation of these facilities. Our research and development provides critical support to our total program by finding solutions to the many technical, safety, environmental, and economic problems which arise during the life of a project from its planning and design to its construction and operation and maintenance.

## CONTRIBUTION TO GROSS NATIONAL PRODUCT AND NATIONAL DEFENSE

Often overlooked, but something we take great pride in, are the benefits realized from the operation of our projects and the assistance we provide in helping others. Last year was exceptional. During Fiscal Year 1986 our projects prevented $26.3 billion in flood damage. When we include our emergency operations, those projects prevented another $1.1 billion. This total of $27.4 billion is almost 3 times the 10-year (1976-1985) average of $9.4 billion. Again these gains or return on our investments reinforce the worth of flood control and the practicality of expecting non-federal interests to contribute an increased share of the costs for such projects. However, the stories behind those numbers are even more dramatic. I will cite two or three incidents that typifies the contribution of our projects and the people that make up the Corps.

In February 1986, the worst flood of record struck California. Our projects and the emergency efforts of many, including our people, reduced the negative effects of those floods by 97 percent and actually prevented some $14 billion in damages. While we cannot calculate lives saved, I am certain there were many, as well as, suffering prevented.

The Corps also responded to some major flood problems in Puerto Rico in October 1985 and May 1986. In October, a tropical wave which later became Tropical Storm Isabel, caused major flooding and extensive landslides. Some 180 people were killed and over 5,000 people were forced from their homes. Damage estimates reached $125 million. In this case, we sent some of our geotechnical people to the landslide area to participate in the search for survivors. And, an ongoing project a few miles away will, when completed, help prevent a similar tragedy in the future.

Another example was Hurricane Juan which first touched land on October 29, 1985, at the Louisiana coast. It's path then crossed Georgia and into the Middle Atlantic States, where it caused the worst flooding disaster since Hurricane Agnes in June of 1972. Well over 200 Corps people, both our civilians and officers, were involved round the clock working in Virginia, West Virginia and Pennsylvania. The hurricane and the accompanying storms caused about $1.0 billion in damages. Corps projects are estimated to have prevented another $550 million in damages.

When I report that Corps projects prevented over $27 billion in damages last year, I know I risk glossing over the certain fact that many lives were saved; lives of people who likely do not know that. And many, many more lives were spared both physical suffering and economic hardship. But this committee should share with the Army pride the quiet work provided by the immense treasure of flood control works across this land.

Over the past 5 years, the same Corps that executes this vital water resources program has been deeply challenged to execute a huge "catch up" military construction program for the U.S. Army and the Air Force.Because of that program, which stretches around the world, we have called on the expertise developed within Civil Works - designers, planners, programmers, engineering specialists, contract experts, construction managers, and inspectors, even environmental specialist brought in to handle the challenges of the 70's as we rose to the Nation's concern over natural resources. The Corps has not been so challenged (in terms of equivalent dollars) since 1951, even as we performed both programs with the smallest number on the payroll since before World War II. We could not have done that with the responsiveness and expertise unless we had sharpened our teeth on our water resources responsibilities. "When we were needed, we were there." That serendipity stands this Nation in good stead.

## MAINTAINING THE CORPS PROFESSIONAL CAPABILITY

### WHERE WE STAND

Key to the Army Corps of Engineers is its investment in our "Human Resources". The enacted 1986 Water Resources Development Act is essential to the Corps maintaining its technical capability and will greatly assist us in retaining our journeymen and attracting bright young engineers and other professionals.

Traditionally our ability to develop and maintain a planning and an engineering and design capability at the district level relies on a workload primarily generated in support of the construction and maintenance programs. Implementing the projects authorized by P.L. 99-662 will increase our overall workload, but the geographical distribution will be far from uniform. Our immediate concern will be to balance the processing of authorized projects through preconstruction engineering and design and the construction phases of our program against the automatic deauthorization provisions of the Act, but in a way that is responsive to our policy objectives.

## POSSIBLE SOLUTIONS AND NEEDS

Manpower cuts are not an issue - our ceilings for Fiscal Year 1987 and Fiscal Year 1988 are the same. However, a rational distribution of our resources, taking into account the new work from P.L. 99-662, may require some changes. We are pursuing the alternative of establishing both regional and national centers of expertise. From an operating standpoint we are considering the concept of minimum size engineering and planning offices for the individual divisions and, where warranted, national centers when specialized expertise is required for unique planning or design activities. In this way, we can concentrate our workload to help provide the work environment and challenge that will assure our being able to retain the best of our professional capability. The current system of piecemealing (brokering) workload among many districts is inefficient and ineffective.

The bottom line is that we need the management flexibility, if we are to achieve two primary objectives of this organization - quality engineering services and efficient use of public resources.

# DEPARTMENT OF THE ARMY
# CORPS OF ENGINEERS - CIVIL WORKS
## SUMMARY OF PROGRAM AMOUNTS FOR FISCAL YEARS 1986,1987, AND 1988
(DOLLARS IN THOUSANDS)

| APPROPRIATION ACCOUNT | FY 1986 (APPROP) | FY 1987 (APPROP) | FY 1988 BUDGET REQUEST |
|---|---|---|---|
| General Investigations | 123,478 | 136,287 | 133,000 |
| Construction, General | | | |
| General Funds | 879,830 | 1,122,950 [a] | 1,150,000 |
| Inland Waterway Trust Funds | 0 | 26,000 | 38,000 |
| Total Appropriation | (879,830) | (1,148,950) | (1,188,000) |
| Operation and Maintenance, General | | | |
| General Funds | 1,260,248 | 1,323,096 | 1,320,800 |
| Harbor Maintenance Trust Funds | 0 | 66,750 [b] | 149,200 |
| Total Appropriation | (1,260,248) | (1,389,846) | (1,470,000) |
| Flood Control, Mississippi R. & Tribs. | 301,225 | 310,797 | 317,000 |
| General Expenses | 105,399 | 118,200 [a] | 128,200 |
| Flood Control & Coastal Emergencies | 48,925 | 10,000 | 26,000 |
| Revolving Fund | 6,699 | 12,000 | 0 |
| Permanent Appropriations | 14,626 | 10,885 | 9,000 |
| Total, Fed. Budget Authority | 2,740,430 | 3,136,965 | 3,271,200 |
| Rivers & Harbors Contributed Funds | 49,064 | 237,000 | 250,000 |
| TOTAL PROGRAM | 2,789,494 | 3,373,965 | 3,521,200 |

[a] Reflects proposed supplemental for transfer of $3.2 million from CG to GE account

[b] Supplemental proposed by Administration

BENEFIT-COST RATIO CALCULATIONS

Senator JOHNSTON. General Heiberg, first, can you tell me in regards to the benefit-cost ratios, does it continue to be true that benefits are calculated on the year of finishing; that is, if you save *x* gallons of fuel, the price of that fuel is calculated as of the date the project is finished and is not subject to inflation?

General HEIBERG. I will need some help on that from my staff, sir. I am advised that the calculations are based on constant dollars, sir, at the time the analysis is done.

Senator JOHNSTON. At the time the analysis is done.

General HEIBERG. Yes, sir.

Senator JOHNSTON. When the Corps originally came up with this formula for benefit-cost ratios, I think the Congress stipulated 2.25 percent on the interest side. Was that the correct amount?

General HEIBERG. It was 2.5 percent discount rate, but that was the rate at that time for a specific project. Are you now addressing a specific project, Mr. Chairman?

Senator JOHNSTON. No; I am addressing the question of benefit-cost ratios and the fact that when the Congress and various parties say something does not meet muster in the benefit-cost ratio and they say, "Well, you ought to have the true cost of money reflected in that benefit-cost ratio," they simply do not understand the way that the Corps calculates the benefit-cost ratio. Really, if you are undertaking a benefit-cost analysis you should not charge at all for the cost of money if you are not charging for inflation or, to the contrary, if you are going to charge for the cost of money then you ought to put in the expected inflation, because either you do them both or you do not do either. Am I correct on that?

General HEIBERG. Sir, maybe I can get some help here on that question.

Mr. DAWSON. If I might, in a general way, Mr. Chairman, say that I think you are making a good point in that we should do whatever we can on a constant dollar basis to make our benefit-cost ratio presentations as credible and as real-world as possible. I think with cost sharing and with the budget squeeze we are going to have to do that, because OMB is not going to be interested, for example, in what the figures were 10 years ago or 5 years ago or 10 years from now. They are going to want comparability as close as possible, as you suggest, on both the benefit and the cost sides. I think the local sponsor, who is going to have to make some harder choices on projects, is going to challenge us in much the same way.

I am not an expert on the economics, but I can say for certain that we need to work with you and see if we can improve the understandability and the currency of both the benefit and the cost estimates.

Senator JOHNSTON. It is a matter of some importance, because the Corps will come in with a benefit-cost ratio calculated under the old law, using the old inflation figures and the old cost figures. And then somebody will come along and say, "Aha, but if you put in 8 percent, or whatever the current cost of money is, this no longer passes muster." But on the other hand, if you put in the expected inflation figures, they would more than outpace the cost of money.

I think I am correct on that general point, am I not?

Mr. DAWSON. I think we try to update both sides. Maybe we need to provide for the record the——

Senator JOHNSTON. Do you have somebody who can answer that question?

Mr. DAWSON. Dr. Ed Dickey from my staff may be able to answer that, Mr. Chairman.

Dr. DICKEY. If I may address that briefly, a benefit-cost analysis done for a Corps project——

Senator JOHNSTON. Excuse me. Would you identify yourself, please?

### USE OF INTEREST RATES

Dr. DICKEY. Yes; I am Edward Dickey, Mr. Dawson's Deputy for Program Planning.

A benefit-cost analysis is an economic analysis. It is done in constant dollars and with what economists call a real interest rate, which is to reflect the real rate of return after inflation, which, if you will, is also done for investments in the private sector. For example, the discount rate that we have now, which is 8$^7/_8$, comes from a formula that is fixed in law, but there is a general consensus that that is at least a reasonable estimate of the current opportunity cost of capital.

Again, what I mean by that is, it is the return which you can earn in the private sector. If you invest in a factory in the private sector, it is the real rate of return.

Senator JOHNSTON. Are you saying that 8$^7/_8$ percent represents real interest today?

Dr. DICKEY. It represents not just interest, but the total return on the investment. That return, of course, goes to stockholders, it goes to bondholders, it goes to the government in the form of taxes: a total return.

Senator JOHNSTON. Dr. Dickey, this is an important point, because it is understood by no one except, I think, you and one or two others. That is that the Corps started with a 2.5 percent real interest rate, which is, of course, the real interest you have earned after inflation.

Then some brilliant people in the Congress came along, who, by the way, were opposed to water projects, and said, "Well, we ought to charge the real cost of money, because who can go out and borrow money at 2.5 percent." Well, they had the Corps; they knew that the Corps was wrong. Yet, the Corps was right all along.

So they used, I guess, 8$^7/_8$ percent on some of these projects without adjusting the inflation side of the ledger. Now, if you are going to go from 2.5 percent, which was the real cost of money, the real interest rate, to 8$^7/_8$, which is the nominal return—that is even above the nominal return; I cannot get 8$^7/_8$ percent if I go buy a CD today—but it was supposed to be at one time what somebody thought was the actual, nominal interest rate.

But we have adjusted one side of the ledger and have not adjusted the other. Am I correct on that?

Dr. DICKEY. Mr. Chairman, I think you will find that the old interest rate of 2.5 or 3.75, depending on what year you look at, was the prevailing rate. That was the actual cost of government borrowing back in those years. We forget that back in the late 1960's and, in fact, in the whole post-World War II period, interest rates were extremely low.

The general argument for the choice of the discount rate is really not tied, strictly speaking, to the cost of government borrowing. It often is in the kinds of discussions that people have. But strictly speaking, the view in terms of the economic perspective is what is the return that is possible to earn on alternative investments? In other words, if I am going to take resources and put them in this project, I am not going to be able to use them in another project.

Senator JOHNSTON. Exactly, but it ought to be the real interest rate, should it not?

Dr. DICKEY. I would say it should be the real discount rate, which is, again, the possible return that you can get in alternative investments.

Senator JOHNSTON. Before inflation or after inflation?

Dr. DICKEY. It is after inflation.

Senator JOHNSTON. That is the real interest rate, what we call the real interest rate.

Dr. DICKEY. Strictly speaking, it is not an interest rate.

Senator JOHNSTON. Real interest is that which I can earn if I take so many dollars and invest it at 5 percent and the inflation rate is 4 percent, then my real interest rate is 1 percent, is it not?

Dr. DICKEY. That is right, sir.

Senator JOHNSTON. And that is really what a benefit-cost ratio ought to do. If it is going to be neutral on the benefit side, it ought to reflect on the cost side no more than the real interest rate.

Dr. DICKEY. That is right, Mr. Chairman. And we believe that the current interest rate is a reasonable estimate of that real return on capital.

Senator JOHNSTON. What, 8 7/8 percent?

Dr. DICKEY. Yes.

Senator JOHNSTON. Well, that's just not true.

Dr. DICKEY. In fact, let me say, Mr. Chairman, that in general——

Senator JOHNSTON. What is the inflation rate today?

Dr. DICKEY. The inflation rate is 2.5, 3 percent.

Senator JOHNSTON. What are they paying on T bills today?

Dr. DICKEY. About 7 percent, 6.5 percent.

Senator JOHNSTON. Then how can the real interest rate—you have inflation at 3 percent and you have 8 7/8 percent in as the cost of money to the government, but 6 percent is what is being paid to borrow its money. How can 8 7/8 percent be the real interest rate?

Dr. DICKEY. Because we are really talking about two different things [Laughter.]

Senator JOHNSTON. Really, we must move on, but I wish you could put something in the record which explains this situation, because the

Corps has changed the way they have done benefit-cost ratios on the interest rate side, not because you suggested it but because it was imposed upon the Corps by the Congress. The two ought to go up or down together, reflecting some consistent policy, and it has not. It is a change that should not have been made.

Thank you very much, Dr. Dickey. I wish you would put that in the record.

Dr. DICKEY. I will, sir.

[The information follows:]

### EXPLANATION OF THE USE OF A DISCOUNT RATE

In order to compare the streams of benefits and costs of public investment in a water resource project, they must be measured at a common point in time. While benefits and costs are measured in constant dollars, a simple summation of them would not be appropriate because people do not generally value $1 to be received in the future at $1 today; rather they discount future values. One reason for this is the existence of investment opportunities which yield a positive rate of return for postponing current consumption in favor of enhanced future productivity. Thus, receiving a dollar's worth of income today is preferred to receiving it later, even though it may not be spent immediately for consumption. Income not expended for current consumption can always be invested to generate even more income in the future. We recognize that resources invested in water resource projects are being diverted away from alternative public and private investments. Therefore, in evaluating the economic efficiency of investment in a water resource project, we discount future benefits and costs to a common, present value.

### MEANS FOR DETERMINING THE DISCOUNT RATE

The discount rate to be applied in project evaluation is provided annually to the Army Corps by the Department of the Treasury.

The discount rate formula currently used in the formulation and evaluation of Federal water and related land resource projects is provided for in the Water Resources Development Act of 1974. Section 80(a) of this act states that the formula shall be the one approved by the President on May 15, 1962, published as Senate Document 97 on May 29, 1962, as amended by the regulation issued by the Water Resources Council and published in the Federal Register on December 24, 1968. This formula provided that the discount rate shall be based upon the average yield during the preceding fiscal year on interest-bearing marketable securities of the United States which, at the time the computation is made, have terms of 15 years or more remaining to maturity. Provided, however, that in no event shall the rate be raised or lowered more than one quarter of 1 percent for any year.

For fiscal year 1987, this rate is 8 7/8 percent.

### CHOOSING AN APPROPRIATE DISCOUNT RATE

The choice of a discount rate in the evaluation of public investments is a continuing topic of discussion among experts. The debate focuses not only on the most appropriate number, but also on the method for choosing and changing it.

It is our view that the discount rate should reflect the opportunity cost of land, labor and capital resources diverted from private to public investment. This shold be the normal rate of return expected from capital investments in the private sector which would enhance the national income, as measured by the flow of goods and services produced in the economy.

A reasonable estimate of this is given in Circular A-94, revised, from the Office of Management and Budget, which is being provided for inclusion in the record.

## INFLATION AS A FACTOR IN THE BENEFIT-COST RATIO

Inflation is not included in Corps benefit-cost studies because a benefit-cost study is a meaasure of the economic merit of an investment. Economic merit refers to the value of a project in terms of the flows of goods and services it produces relative to its cost. The prices of goods and services used to evaluate the benefit-cost ratio for a water resource project are those expected to prevail during or immediately preceding the period of planning. These are taken to represent the real value relationships expected over the life of the project unless some specific evidence indicates that the real exchange values are expected to change. Expected changes in economic activity, e.g. changes in structures on a flood plain, or level of traffic on a waterway, are included in the analysis, but without projection of relative price shifts.

# MEMORANDUM FROM GEORGE P. SHULTZ, DIRECTOR, OFFICE OF MANAGEMENT AND BUDGET

March 27, 1972

CIRCULAR NO. A-94
Revised

TO THE HEADS OF EXECUTIVE DEPARTMENTS AND ESTABLISHMENTS

SUBJECT: Discount rates to be used in evaluating time-distributed costs and benefits

1. Purpose. This Circular prescribes a standard discount rate to be used in evaluating the measurable costs and/or benefits of programs or projects when they are distributed over time.

2. Rescission. This Circular replaces and rescinds Office of Management and Budget (OMB) Circular No. A-94 dated June 26, 1969.

3. Scope.

a. This Circular applies to all agencies of the executive branch of the Federal Government except the U.S. Postal Service. The discount rate prescribed in this Circular applies to the evaluation of Government decisions concerning the initiation, renewal or expansion of all programs or projects, other than those specifically exempted below, for which the adoption is expected to commit the Government to a series of measurable costs extending over three or more years or which result in a series of benefits that extend three or more years beyond the inception date.

b. Specifically exempted from the scope of this Circular are decisions concerning water resource projects (guidance for which is the approved Water Resources Principles and Standards), the Government of the District of Columbia, and non-Federal recipients of Federal loans or grants.

c. The remaining exemptions derive from the secondary nature of the decisions involved; that is, how to acquire assets or proceed with a program after an affirmative decision to initiate, renew, or expand such a program using this Circular. Thus:

(1) This Circular would not apply to the evaluation of decisions concerning how to obtain the use of real property, such as by lease or purchase.

(2) This Circular would not apply to the evaluation of decisions concerning the acquisition of commercial-type services by Government or contractor operation, guidance for which is OMB Circular No. A-76.

(3) This Circular would not apply to the evaluation of decisions concerning how to select automatic data processing equipment, guidance for which is OMB Circular No. A-54 and OMB Bulletin No. 60-6.

d. The discount rates prescribed in this Circular are:

(1) Suggested for use in the internal planning documents of the agencies in the executive branch;

(2) Required for use in program analyses submitted to the Office of Management and Budget in support of legislative and budget programs.

This Circular does not supersede agency practices which are prescribed by or pursuant to law, Executive order, or other relevant Circulars. Agencies should evaluate their programs and projects in accordance with existing requirements and, in addition, summarize the present value costs and/or benefits using the discount rate prescribed in this Circular.

4. Definitions. Analytic documents submitted to the Office of Management and Budget should be based on the following concepts where relevant:

a. Expected annual cost means the expected annual dollar value (in constant dollars) of resources, goods, and services required to establish and carry out a program or project. Estimates of expected yearly costs will be based on established definitions and practices for program and project evaluation. However, all economic costs, including acquisition, possession, and operation costs, must be included whether or not actually paid by the Federal Government. Such costs not generally involving a direct Federal payment include imputed market values of public property and State and local property taxes foregone.

b. Expected annual benefit means the dollar value (in constant dollars) of goods and services expected to result from a program or project for each of the years it is in operation. Estimates of expected yearly benefits will be based on established definitions and practices developed by agencies for program and project evaluation.

c. Expected annual effects means an objective, nonmonetary measure of program effects expected for each of the years a program or project is in operation. When dollar value cannot be placed on the effects of comparable programs or projects, an objective measure of effects may be available and useful to enable the comparison of alternative means of achieving specified objectives on the basis of their relative present value costs. These effects should be estimated for each year of the planning period and are not to be discounted.

d. Discount rate means the interest rate used in calculating the present value of expected yearly costs and benefits.

e. Discount factor means the factor for any specific discount rate which translates expected cost or benefit in any specific future year into its present value. The discount factor is equal to $1/(1+r)^t$, where $r$ is the discount rate and $t$ is the number of years since the date of initiation, renewal or expansion of a program or project.

f. Present value cost means each year's expected yearly cost multiplied by its discount factor and then summed over all years of the planning period.

g. Present value benefit means each year's expected yearly benefit multiplied by its discount factor and then summed over all years of the planning period.

h. Present value net benefit means the difference between present value benefit (item g) and present value cost (item f).

i. Benefit-cost ratio means present value benefit (item g) divided by present value cost (item f).

Attachment A contains an example that illustrates calculation of the present value information.

5. Treatment of inflation. All estimates of the costs and benefits for each year of the planning period should be made in constant dollars; i.e., in terms of the general purchasing power of the dollar at the time of decision. Estimates may reflect changes in the relative prices of cost and/or benefit components, where there is a reasonable basis for estimating such changes, but should not include any forecasted change in the general price level during the planning period.

6. Treatment of uncertainty. Actual costs and benefits in future years are likely to differ from those expected at the time of decision. For those cases for which there is a reasonable basis to estimate the variability of future costs and benefits, the sensitivity of proposed programs and projects to this variability should be evaluated.

The expected annual costs and benefits (or effects) should be supplemented with estimates of minimum and maximum values. Present value cost and benefits should be calculated for each of these estimates. The probability that each of the possible cost and benefit estimates may be realized should also be discussed, even when there is no basis for a precise quantitative estimate. Uncertainty of the cost and benefit (or effects) estimates should be treated explicitly, as described above. The prescribed discount rate should be used to evaluate all alternatives. Specifically, the evaluations should not use different discount rates to reflect the relative uncertainty of the alternatives.

7. Discount rate policy. The discount rates to be used for evaluations of programs and projects subject to the guidance of this Circular are as follows:

a. A rate of 10 percent; and, where relevant,

b. Any other rate prescribed by or pursuant to law, Executive order, or other relevant Circulars.

The prescribed discount rate of 10 percent represents an estimate of the average rate of return on private investment, before taxes and after inflation.

To assist in calculation, Attachment B contains discount factors for the discount rate of 10.0 percent for each of the years from one to fifty.

8. Interpretation. Questions concerning interpretation of this Circular should be addressed to the Assistant Director for Evaluation, Office of Management and Budget (395-3614).

GEORGE P. SHULTZ
DIRECTOR

Attachments

ATTACHMENT A
Circular No. A-94
Revised

## SAMPLE FORMAT FOR DISCOUNTING DEFERRED COSTS AND BENEFITS

Assume a ten-year program which will commit the Government to the stream of expenditures appearing in column (2) of the table below and which will result in a series of benefits appearing in column (3). The discount factor for a 10 percent discount rate is presented in column (4). Present value cost for each of the ten years is calculated by multiplying column (2) by column (4); present value benefit for each of the ten years is calculated by multiplying column (3) by column (4). Present value costs and benefits are presented in columns (5) and (6), respectively.

| Year since initiation, renewal or expansion (1) | Expected yearly cost (2) | Expected yearly benefit (3) | Discount factor for 10 percent (4) | Present value cost [Col. (2) x Col. (4)] (5) | Present value benefit [Col. (3) x Col. (4)] (6) |
|---|---|---|---|---|---|
| 1 | $10 | $0 | 0.909 | $9.1 | $0.0 |
| 2 | 20 | 0 | 0.826 | 16.5 | 0.0 |
| 3 | 30 | 5 | 0.751 | 22.5 | 3.8 |
| 4 | 30 | 10 | 0.683 | 20.5 | 6.8 |
| 5 | 20 | 30 | 0.621 | 12.4 | 18.6 |
| 6 | 10 | 40 | 0.564 | 5.6 | 22.6 |
| 7 | 5 | 40 | 0.513 | 2.6 | 20.5 |
| 8 | 5 | 40 | 0.467 | 2.3 | 18.7 |
| 9 | 5 | 40 | 0.424 | 2.1 | 17.0 |
| 10 | 5 | 25 | 0.386 | 1.9 | 9.7 |
|  |  |  |  | $95.5 | $117.7 |

The sum of column (5) is present value cost: $95.5
The sum of column (6) is present value benefit: $117.7

Present value net benefit is the difference between present value total benefit and present value total cost: $117.7 - $95.5 = $22.2.

The benefit-cost ratio is 117.7/95.5 = 1.23.

NOTE: For more difficult discounting problems, a recommended reference is Principles of Engineering Economy, by Eugene L. Grant and W. G. Ireson, Ronald Press Company, 1960.

ATTACHMENT B
Circular No. A-94
Revised

## DISCOUNT FACTORS

| Year since initiation, renewal or expansion | Discount factors* | Year since initiation, renewal or expansion | Discount factors* |
|---|---|---|---|
| 1 | 0.909091 | 26 | 0.083905 |
| 2 | 0.826446 | 27 | 0.076278 |
| 3 | 0.751315 | 28 | 0.069343 |
| 4 | 0.683013 | 29 | 0.063039 |
| 5 | 0.620921 | 30 | 0.057309 |
| 6 | 0.564474 | 31 | 0.052099 |
| 7 | 0.513158 | 32 | 0.047362 |
| 8 | 0.466507 | 33 | 0.043057 |
| 9 | 0.424098 | 34 | 0.039143 |
| 10 | 0.385543 | 35 | 0.035584 |
| 11 | 0.350494 | 36 | 0.032349 |
| 12 | 0.318631 | 37 | 0.029408 |
| 13 | 0.289664 | 38 | 0.026735 |
| 14 | 0.263331 | 39 | 0.024304 |
| 15 | 0.239392 | 40 | 0.022095 |
| 16 | 0.217629 | 41 | 0.020086 |
| 17 | 0.197845 | 42 | 0.018260 |
| 18 | 0.179859 | 43 | 0.016600 |
| 19 | 0.163508 | 44 | 0.015091 |
| 20 | 0.148644 | 45 | 0.013719 |
| 21 | 0.135131 | 46 | 0.012472 |
| 22 | 0.122846 | 47 | 0.011338 |
| 23 | 0.111678 | 48 | 0.010307 |
| 24 | 0.101526 | 49 | 0.009370 |
| 25 | 0.092296 | 50 | 0.008519 |

*The discount factors presented in the table above implicitly assume end-of-year lump-sum costs and returns. When costs and returns occur in a steady stream, applying mid-year discount factors may be more appropriate. Present value cost and benefit computed from this table can be converted to a mid-year discounting basis by multiplying them by the factor 1.048809.

For example, if the present value cost of a series of annual expenditures computed from the above table is $1,200.00, the present value cost on a mid-year discounting basis is $1,200.00 x 1.048809 or $1,258.57.

### COST-SHARING AGREEMENTS

Senator JOHNSTON. Have local sponsors signed binding cost-sharing agreements on each of the 13 new projects proposed in the 1988 budget?

Mr. DAWSON. No; but we believe that we can secure those, Mr. Chairman, easily if we get approval to go forward.

### REPROGRAMMING POLICY

Senator JOHNSTON. I notice, Mr. Dawson, your statement mentions several cases where you intend to reprogram funds in excess of the amounts provided by the Congress because, in your judgment, the work is important. Under what authority are you allowed to reprogram available O&M funds? Is it statutory language or based on committee report language and custom?

Mr. DAWSON. Sir, it is a combination of committee report language; and of course, whatever reprogramming we would propose to do has to be submitted to you and your House counterpart and approval given or withheld before we go forward.

Reprogramming within a lump sum appropriation such as operation and maintenance, general, is well written in the law, but we consider notification, or the Appropriation Committees of our planned reprogramming to be appropriate in these instances where it is obvious that our actions could be viewed as contrary to committee guidance.

Senator JOHNSTON. In light of the problems in this area, the committee would ask that you make this request to reprogram funds to the general regulatory program and the waterborne statistics program in writing and that no action be taken to reprogram these funds in advance of committee approval. Could you do that?

Mr. DAWSON. Yes; we can do that.

### REPORT LANGUAGE VERSUS ACT LANGUAGE

Senator JOHNSTON. Does the Department of the Army consider report language as binding or mandatory, or where the Congress wants to accomplish something, must it put it in the statute?

Mr. DAWSON. Mr. Chairman, for the overwhelming majority of the time, we comply with the committee report language. The only times we do not is when the report language is 180 degrees in opposition to the President's policies. In those infrequent instances, we feel compelled to ask the Congress to reconsider, and then if they still feel strongly, to put it in the law.

Senator JOHNSTON. We certainly will consider all requests to reconsider. But I am asking specifically: Will you respect matters put in the report language always or just some of the times?

Mr. DAWSON. We will respect it in the overwhelming majority of the circumstances, Mr. Chairman. And only when there is a contravention of policy—and those policies we have tried to make clear and public ahead of time so it is not a matter of later coming in and surprising the committee in not going along with report language.

The main point, though, I would leave with you is we respect very deeply and, again, follow nearly always the report language that the committee writes.

Senator JOHNSTON. When we do put it in the statute, will you follow the letter and the spirit of the law?

Mr. DAWSON. Absolutely.

## RED RIVER WATERWAY, LA.

Senator JOHNSTON. I hope that is done. I have found a number of instances in, to be plain about it, the Red River Waterway project where I think the spirit certainly, and sometimes the letter of the law, has not been fully complied with. I hope we are not going to be exerting a huge amount of our time and energy on refighting old battles that, as far as I am concerned, have been fought. I hope we will be able to continue on that project and others on which the Congress has expressed itself over and over again and will continue to express itself.

## COOPER RIVER SEISMIC MODIFICATION PROJECT, SOUTH CAROLINA

Senator Hollings, reference has been made to a dam in South Carolina which is owned by a nonfederal interest. I suppose that brought you over here, so I will recognize you at this time.

Senator HOLLINGS. Thank you, Mr. Chairman.

Mr. Secretary, I apologize for not being here for the early part of your testimony. With respect to the comments, I understand that the government takes the position that this is a state dam.

### HISTORICAL BACKGROUND

To refresh your memory on the historical facts, in the mid-1930's this was built as a federal dam, in fact, for the government.

In the early days of my law practice, I had to represent it as a federal navigation project. The monies that went into it were federal. That means in poor, illiterate, low-per-capita-income South Carolina in 1935 and 1936 when they started it, there just was not any money.

The federal government put up the money and built it as a navigation project. And on the premise of the navigation project, this particular committee, Mr. Chairman, came around with the Cooper River rediversion. We put $180 million in there, because in the construction we joined the two rivers together. Now, we since have silted up the Charleston Harbor—the Corps of Engineers and General Heiberg are fully familiar with this. Senator Stennis has all of the Corps' dredges down in Mississippi, but when I can get one, then we dredge the harbor and we are paying out a fortune to do it.

So we have a $180 million project, that you have, Secretary Dawson, on the basis of a federal program. You did not come out there on a welfare program and say, "Well, what we ought to do is just spend $180 million because the state goofed." It was the federal government's project and it is not a goof. On the contrary, it has been a very valuable, good project that we appointed in accordance with the requirements of the federal government and the particular authority.

### PROTECTION OF EXISTING FEDERAL INVESTMENT

Now, we come to the danger that we have, not only protecting the dam itself from the seismic damage, but protecting the federal investment we are making in that area. I guess you have several offices running down the hall; in one office you are saying this is federal and in the other office you are saying oh, no, it is state.

I think we ought to come to an understanding to begin with that this is a federal dam that was constructed as such and the federal government certainly owes a responsibility to itself. That is why this Congress approved last year, without any matching funds or otherwise, the $8 million.

Now, I was not here to hear the lecture about being a state dam and we should not get off and start taking over the state responsibilities. I could agree with that. If you and I were to start taking on the state's responsibilities, there would not be enough money in the federal Treasury. But we have established that fact, judicially as well as legislatively, congressionally and politically, that it is a federal project. And therein it was constructed and has been engaged in ever since, and the only way we have been able to sell our bonds has been with that particular support.

I would be glad to hear your response, because I understand now we are coming in and trying to change the rules after the game. We put the money up and we will continue to put the money up, but now we are trying to say, all of a sudden, we disagree with you, Congress; you might have thought it was a federal thing and you made a federal appropriation, but as I translate it correctly, Mr. Secretary, you made a bad mistake because it should not be a federal appropriation for this state dam.

### PROJECT OWNERSHIP

Mr. DAWSON. Senator Hollings, thank you for the opportunity to address that point. We believe, additionally, that the ownership of this dam is in the hands of the South Carolina public utility. It is on their books; it is not on the federal government's books. We are very concerned, as you alluded to, to the hundreds of dams that are out there that are not in federal ownership.

We are not quarreling over decisions that the Congress has made in the past. What we are asking you, sir, to consider—and we recognize that without your strong interest in this project we would not be where we are now, which is basically having spent $2 million to get the best design money can buy in the world, free of charge, for what we think is a nonfederal dam, and then there is nearly $8 million that you have been responsible for.

### POTENTIAL FOR COST SHARING

Our request, if the rescission request is not approved, which we frankly do not expect you to approve—then what we are hoping is that there might be a consideration for cost sharing. Given the spirit and the letter of the new law that the Congress passed late last session maybe we could talk about cost sharing. In other words, $8 million is already in the pocket, along with the $2 million for the design. There is $12 million that is still on the table that we have to worry about in our budget that you, of course, would be addressing in your own consideration.

Our hope would be that we could address this and stop—what we are worried about would be a precedent that would get us into an area at a time when we do not have the money to pay for the flood control and navigation projects around the country that the Congress has also said we deeply need, and we agree that we do need.

So my plea to you, sir, is that we have an opportunity to pursue some of these other approaches.

### PROJECT CONSTRUCTION

Senator JOHNSTON. Senator Hollings, would you yield on that? I know we are talking about the Pinopolis Dam. Was that not built by the WPA?

Senator HOLLINGS. I was going to say the government did not start when the Secretary and I came to Washington; this project came into being 40 or 50 years before either of us got here. It is a federal dam, and they constructed it. If it has a seismic fault, it is their fault, and we recognize that in the Congress.

We recognize, in addition, your use of flood and navigation controls. That is the judicial decision on the Santee-Cooper project. Federal courts have found that it is a federal navigation project.

You see, I have had cases on the other side where they flooded all of the rice dikes for duck fields and they want the Santee-Cooper to pay for it. We had to go to court and we had to prove just exactly what it was, and they proved it was a federal navigation and flood control project. I am in lockstep with you.

This does not happen to be a dam to get some hydroelectric power. This dam is the defense for the Sixth Naval District and all of the facilities up there, all the nuclear submarines. They are not down in Saint Mary's, Ga.; the majority of them are right in my back yard in Charleston. That is what we are talking about, and that is why we are undertaking the rediversion project. We are running the river back down another stream, and you are digging it. And you are doing a good job, gentlemen.

Senator JOHNSTON. I am concerned about this, because I do not want to get exceptions and set a precedent to undertake work on nonfederal dams. But you are not being asked to rehabilitate that part of the project which relates to power production, any of the machinery to generate electricity. In other words, we have a flood control element to the dam and an electricity element to the dam. Are you being asked to do anything which enhances the hydroelectric generation capability for the local people?

Mr. DAWSON. No, sir; although I think it is hard to clearly separate the two. For the dam itself, you can certainly make the points you have made.

### BASIS FOR WORK AUTHORIZED

Senator **Johnston**. When we authorized this, we did it on the basis that it was originally built by the federal government; it was important as a flood control measure for federal concerns, all the defense industry in the Charleston area. On that basis we thought it was different from just going in and rebuilding a state-owned dam or privately owned dam.

Mr. **Dawson**. Mr. Chairman, if I may, it is not that different. That is what concerns us. There are many dams around the country that have federal facilities downstream. That distinction, we are afraid, is not much of a distinction.

Senator **Johnston**. It was built by the federal government?

Mr. **Dawson**. Yes, sir; as many others were with WPA and CCC funds. But ever since, it has been owned, operated, and maintained by the South Carolina public utility. If you ask them to list their assets, they would list it as one of their assets. They would not say it belongs to the federal government.

The fact is that in our opinion, and in their opinion, I believe, they would say it belongs to them.

Senator **Hollings**. There is no question about the ownership. But you built it with the crack. If you had not built it with the crack, we would not be here. We built it to your specifications with your money. Then you are coming around and saying we gave you a crack and, by the way, you own the crack. [Laughter.]

Mr. **Dawson**. I would disagree with your characterization, Senator.

General **Heiberg**. I am not sure about that.

Senator **Hollings**. There is no question about that. We do not need this seismic thing. We do not have to go to FERC. You have another federal agency, again, down the hall, another hall. Oh, no. You cannot play games that way. There is no question.

Let's say all that you have said is a fact. We differ on those facts obviously, Mr. Secretary, but let's say they were considered, which they were. We have heard this before at this particular committee level. We found otherwise, and we put the money there and not with the cost-sharing provision. We have authorized the $22 million, Mr. Chairman. The authorization is there, and the Appropriations Committee has acted.

Having heard what you said, you are trying to change the policy. I understand your disagreement with the policy. But that is not the law; that is not what we passed. We appropriated for it.

### CONCERN FOR PRECEDENT

Mr. **Dawson**. Yes, sir; but I think the reason you ask us to come here each year, in part, is to give you our honest opinion and to ask for changes.

Senator **Hollings**. And you still do not like it, but that is post facto.

Mr. **Dawson**. I think, again, it is the precedent that we are concerned about, and we are talking about hundreds of these dams that would fit the same criteria. With all due respect, in our judgment it is being used here, and that concerns us at a time when our program is receiving good support from OMB and good support from the Congress, from many people who do not always appreciate the value of water projects. So we are very concerned.

The reason we are back again asking your reconsideration is that we are concerned that our program have a stature and a defensibility that will keep our progress moving ahead.

Senator JOHNSTON. We are not going to start making a lot of exceptions. This new bill was hard enough to get through, and it is going to be harder to get project authorizations through this committee than it would be to get a camel through the eye of a needle. [Laughter.]

Senator HOLLINGS. Exactly.

Senator JOHNSTON. So we may make this one exception because it was built by the WPA. There are defense consideration here, and it has been authorized. But we are not going to start making a lot of exceptions. We do not have enough money to do that.

### CHARLESTON HARBOR DEEPENING, WANDO RIVER EXTENSION, SOUTH CAROLINA

Senator HOLLINGS. Let me ask one further question. I appreciate the Secretary's presentation. As I understand, there is no money included in the budget for the Wando River, with respect to the dredging, and if there was another $130,000 that could be used in fiscal year 1988?

Mr. DAWSON. The capabilities?

Senator HOLLINGS. Capabilities; that is correct.

Mr. DAWSON. That is correct, I think.

Senator HOLLINGS. I just wanted that on the record. I appreciate that. Thank you.

Thank you, Mr. Chairman. I am sorry, I did not mean to take that much time.

Senator DOMENICI. Mr. Chairman, I am pleased to join you, Senator Johnston, in your first chairing of this subcommittee.

Senator JOHNSTON. It is the first one in a long time. We had a rest for a little while. [Laughter.]

Senator DOMENICI. It has been so long for me that I have forgotten how it was the other way.

Senator JOHNSTON. You have forgotten what we did for you years ago?

Senator DOMENICI. I forgot what you did to us then.

But in any event, I understand that the Southwestern Division will testify later, so I do not want to use a lot of time today. My state and its projects under the new cost-sharing approach came out very well.

## ACEQUIAS REHABILITATION PROGRAM, NEW MEXICO

But I would ask, if I could, to clarify one issue affecting my state, because it is a matter of urgency to get a letter as to what the Corps' capability is for the new Acequias rehabilitation program. I will hold my other Southwestern issues until you have that subcommitee hearing. I will just take a couple of minutes.

We have discussed, Mr. Secretary and General Heiberg, the section 1113 of Public Law 99–662, that establishes a program for the renovation of the Acequias in New Mexico. I talked with you about it some time ago, and recently I gave you a letter asking for information regarding the capability of the Corps to undertake construction in fiscal year 1988.

We have $500,000 in the program this year. Your local office is using that $500,000 to do some evaluations and studies. There is an authorized federal level of $40 million for this program statewide; and we need, as quickly as possible, an evaluation from you as to what your capability is to undertake Acequias rehabilitation work in fiscal year 1988.

I am wondering how long it will be before you can get us this evaluation of your capability and what you would plan to do so my state can think about where it gets its matching funds.

Mr. DAWSON. Senator Domenici, we are already hard at work on that, because of the strong interest that you have expressed on more than one occasion. The Albuquerque District, as you know, is preparing a report with $200,000 of that $500,000 that you were instrumental in having appropriated already. We are also moving toward giving you an estimate of the amount of money that we need.

Let me ask my colleagues if we can set a date. I know you do need that on an imminent basis.

Senator DOMENICI. If you cannot give us the date today, that will be all right, as long as I have here on the record an understanding that you are committed to getting us that estimate quickly. That means well ahead of this appropriations cycle so that we will not be arbitrarily saying, "Let's put in $10 million or $20 million." We ought to know what you can prudently utilize.

Mr. DAWSON. Yes. As we mentioned to you, sir, in previous discussions, that is absolutely our understanding, because we do want to move forward on this. You have certainly made a clear case for the need to move ahead, and we want to do it at a pace that we can use the money effectively. So as you say, we will be getting that to you well ahead of when you and your colleagues will be making decisions on the budget.

Senator DOMENICI. You were about to set some deadline for yourself. Can you do that? Can you and the General tell us whether it will be 2 weeks, a month? Our state legislature does not meet very long. General?

General HEIBERG. Sir, we really have two answers here. I have committed to the Secretary that we will get to him for his approval the report this September. It will have in it those things that you and the

Secretary discussed. Mr. Dawson and I are committed to you to get you something in the next several weeks that will give you a basis to talk to your colleagues. I do not have a date that I can give you.

Senator DOMENICI. Can you, perhaps, commit yourself to the sooner, the better for our purposes. We want to get the program started on the right track.

Mr. DAWSON. Absolutely.

General HEIBERG. Yes, sir.

### COST-SHARING EXCEPTIONS

Senator DOMENICI. Mr. Chairman, finally, let me make an observation about cost sharing. I am going to be your ally. I do not want to get involved in the issue that my friend, Senator Hollings, just raised. But I do know that it took a lot of people, a lot of committees, a lot of effort to get a national program started that has new starts and has a real chance of getting programs started that we previously had no chance of getting through.

I appreciate your remarks that exceptions to the rule are going to be few and far between.

Senator Hollings, I was not addressing your issue. I am not involved, nor am I familiar with that project.

But I am delighted, Mr. Chairman, to make that point. I think you will have a devil of a time as chairman if we start making exceptions to cost sharing. We have communities that need protection and are out getting bonded. They are having county commission meetings to raise $200,000 and up for their share of projects that used to be fully financed by the federal government.

I think you must know that is terribly important across this land. We will get lots of projects started this way. Otherwise, we are going to be back with the stalemate that started about 10 years ago, continued through President Carter all the way up to the Reagan administration.

Senator JOHNSTON. I strongly agree with that. I worked hard on this bill, as you and others did and I want to see it succeed. I hope the administration will request enough money to fund many of the high-priority items authorized in it; and we will work on the budget members in the Budget Committee. I hope we will find a way to move forward in a positive way.

## COOPER RIVER SEISMIC MODIFICATION, SOUTH CAROLINA

### FEDERAL RESPONSIBILITY

Senator HOLLINGS. Mr. Chairman, let me add one comment to make the record clear. This is not the exception. This is the question of having federal construction, which has now been funded by a federal entity, to be unsafe and should be corrected. As a result, the federal government has turned around through its Corps of Engineers and said, "Let's get that river back where it was."

We just spent a fortune. It has not worked. We silted up Charleston Harbor. And we have the entire defense establishment down there spending millions and millions and millions of dollars every year.

So this is a cost-saving proposition that the federal government made mistakenly in two instances: one with respect to seismic safety and the other with respect to the actual harbor itself and its defense establishment. So this has been a federal entity going on all the time, and we are getting the tail of it.

I mean the Congress has decided that, and it is not an exception. It is in the federal interest, and that is why we are working in the federal interest.

Senator JOHNSTON. Thank you, Senator Hollings.

Before I recognize the Junior Senator from Mississippi, I would like to say that Senator Stennis cannot be here and sends his regrets. He, of course, was a long-time chairman of this subcommittee. He sends his best wishes to the Assistant Secretary, General Heiberg, and all the members of the Corps assembled.

Senator Cochran?

Senator COCHRAN. Thank you very much, Mr. Chairman.

### IMPLEMENTING NEW WATER RESOURCES ACT

Secretary Dawson, I understand that you have one of the toughest jobs in town, and that is implementing the new water resources bill that was passed last year and trying to work out answers to specific questions about cost ~~sharing an~~d other similarly interesting challenges.

I want to assure you that even though we have many difficult questions to deal with in my state of Mississippi on those subjects, we intend to work with you. I know that we can solve most of those problems. I hope we can solve them all.

Mr. DAWSON. Thank you, sir.

### ABILITY-TO-PAY ISSUE

Senator COCHRAN. When do you think the local sponsors will be informed about the status of the questionable projects in terms of procedures to satisfy cost-sharing and ability-to-pay provisions of the law? What does the time frame look like?

Mr. DAWSON. Senator, there are, as you know, some 640 provisions in the law, and we are finding that every one of those provisions is the most important ever enacted to someone. But we are proceeding at a steady pace to address all of those.

You mentioned two of the most important provisions. Cost sharing we have already addressed and we have sent guidance out to the field. I submitted for the record today our judgment on the implementation of the cost-sharing provisions. The ability-to-pay provision, which you mentioned, is another very important provision and a very challenging one. We have worked on that, and we expect in the next few weeks to publish that in some form and share with the committee to get input before we implement that ability-to-pay provision. But we are moving quickly, because we recognize that that is a provision that you and other Members of the Senate have a special interest in, along with other provisions.

So, in short, I think we are making some good headway on not only those two provisions, but all of the provisions in the bill to be able to present a full implementation package. In fact, as we get to the various sections, we are going ahead and implementing them as we come to them rather than waiting for the whole package.

### MISSISSIPPI RIVER AND TRIBUTARIES PROJECT

Senator COCHRAN. In our part of the country we are going to continue to be very dependent upon the Corps of Engineers for assistance in helping to protect our lands and homes and people from damage and death as a result of flooding. We have got the privilege of being right there in the part of that Mississippi River funnel where 40 percent, more or less, of the nation's water drains through.

The Mississippi River and tributaries project, in particular, needs to be completed, and I hope that we can move with dispatch to complete those portions of that project which remain incomplete.

### RESEARCH AND DEVELOPMENT

The statement of General Heiberg addresses the need for research funding in the area of water resource development. I am personally familiar with the outstanding work that has been done and is being done at the Waterways Experiment Station in Vicksburg, Miss., which is a jewel in the crown, so to speak, for research activity, not only for the Corps of Engineers but for other federal agencies and the private sector as well. Other segments of the Defense Department utilize the expertise of the resources at the station. While it does not appear as a line item in our budget here, it is a very important activity.

I wonder, for the record, if you would be kind enough to provide a summary of overall Corps reserach funding and a breakout of those funds that are utilized from the budget at the Waterways Experiment Station in Vicksburg.

General HEIBERG. Sir, we will certainly do that. I might note for the group that is here at the moment that in our wisdom of sending some of the best officers that we have down to the Waterways Experiment Station, two of the last three have the last name of Lee.

Senator COCHRAN. That shows very good judgment.

General HEIBERG. We will furnish that to you, sir.

[The information follows:]

### CIVIL WORKS RESEARCH AND DEVELOPMENT

A chart which shows both real and constant dollars for overall Corps civil works research and development funding and a breakdown of these R&D funds for the Waterways Experiment Station for fiscal year 1981 to fiscal year 1987 is as follows:

[In millions of dollars]

| Fiscal year | Fiscal year 1987 Real dollars | Constant dollars |
|---|---|---|
| | CORPS CIVIL WORKS R&D | |
| 1981 | 28.5 | 38.1 |
| 1982 | 27.4 | 34.4 |
| 1983 | 28.7 | 32.3 |
| 1984 | 28.3 | 30.1 |
| 1985 | 33.0 | 34.7 |
| 1986 | 33.6 | 35.8 |
| 1987 | 30.4 | 30.4 |
| | WATERWAYS EXPERIMENT STATION PORTION OF CORPS CIVIL WORKS R&D | |
| 1981 | 23.1 | 30.9 |
| 1982 | 23.1 | 28.9 |
| 1983 | 23.5 | 26.5 |
| 1984 | 21.7 | 23.1 |
| 1985 | 23.7 | 24.9 |
| 1986 | 23.5 | 25.1 |
| 1987 | 22.6 | 22.6 |

## CORPS OF ENGINEERS REGIONAL CENTERS

Senator COCHRAN. We have been blessed in that area of our state to have very high quality personnel assigned to that station, military and civilian. Most of those who work at that station are civilians.

General HEIBERG. Yes, sir; and they are among the best that we have in the federal government, in my view. Dr. Robert Whalen, for example, the technical director down there, is a superb civil servant who really represents the whole federal bureaucracy in an extremely good way.

Senator COCHRAN. Also, I want to be sure that when we talk about considering national centers for specialized engineering and planning functions, that we not overlook the fact that there is an established asset there that could be utilized as a center for research and planning. The weather is fine down there, and you might take a careful look at that as the center for such research.

Thank you very much, Mr. Chairman.

Senator JOHNSTON. Thank you very much, gentlemen.

We have a vote on, so we will take a short recess before we hear from General Edgar.

## ADDITIONAL PREPARED QUESTIONS FOR THE RECORD

I also have some questions which I will include in the record at this point for your response. And I understand Senators Hatfield, McClure, Specter, Chiles, and Sarbanes have submitted questions for the record.

[CLERK'S NOTE: The following questions were not asked, but were placed in the hearing record for the agency's response.]

[A brief recess was taken.]

## QUESTIONS SUBMITTED BY SENATOR JOHNSTON

### Implementation of Water Resource Development Act of 1986

Senator JOHNSTON. Mr. Dawson, how would you assess P.L. 99-662 as it relates to the water resource policy positions taken by this Administration? Does it reflect nearly 100%, 80%, etc. of the policy objectives promoted by the Administration?

Mr. DAWSON. I think it's reasonable to say that the Administration achieved a very high degree of success. I'm thinking in particular of the cost sharing formulas applicable to commercial navigation and flood control, which are of course the main line output of the Corps program. I think we have achieved a meaningful reform there and that these changes will bring about significantly different ways of doing business in the future. On the other hand, we have to recognize that included in Public Law 99-662 are a number of kinds of projects which we don't intend to support in a budgetary sense--such things as the slackwater ports, recreation, and a variety of non-traditional kinds of projects. We must consider these, however, to be peripheral to the main focus of the legislation, which of course is the cost sharing. As far as supporting the new legislation, I think the best evidence of that is the very, very, strong budget which I've been pleased to present to you.

Senator JOHNSTON. How committed are you and this Administration to assuring all that seek an opportunity to participate under the new provisions will be given a fair review of their project and individual circumstances?

Mr. DAWSON. We intend to give every sponsor a fair review in terms of merits of the project and the sponsor's individual circumstances. In saying this I want to make clear, however, that we will continue to prioritize projects within the context of our budgetary priorities. We will continue to give budgetary preference to flood control and commercial navigation development, as opposed to other types of water resource development. I think that, in order for any program to enjoy the support of Congress, it must appeal to all regions of the Nation, and indeed I know of few regions which do not have substantial flood control problems and certainly much of our Nation has an interest either directly or indirectly in development of our commercial navigation capability. I don't think, however, we can give equal consideration to all project purposes, given the limited funds that we will have available for the foreseeable future. It is important to continue to give priority to the traditional flood control and commercial navigation activities. These are uniquely a responsibility of the Civil Works program and should continue to be the focus of our budgetary resources.

Senator JOHNSTON. How important is it to have balance as to region and project purpose?

Mr. DAWSON. I think that, in order for any program to enjoy the support of Congress, it must appeal to all regions of the Nation, and indeed I know of few regions which do not have substantial flood control problems and certainly much of our Nation has an interest either directly or indirectly in development of our commercial navigation capability. I don't think, however, we can give equal consideration to all project purposes, given the limited funds that we will have available for the foreseeable future. It is important to continue to give priority to the traditional flood control and commercial navigation activities. These are uniquely a responsibility of the Civil Works program and should continue to be the focus of our budgetary resources.

Senator JOHNSTON. If a non-Federal entity fulfilled all of the requirement under P.L. 99-662 for a recreation project and there was significant return to the Federal government, would such a project be judged and receive the same consideration as say a navigation or flood control project?

Mr. DAWSON. If this was a project where more than 50 percent of the total project benefits were for recreation then I would say no. The project would not receive the same consideration as say a navigation or flood control project. The fact that there is a cost sharing policy established for a particular project output does not necessarily mean that the Administration is willing to budget for projects producing primarily that output. When recreation is included in a multi-purpose project, the development will be cost shared on a 50/50 basis. That does not mean, however, that the Administration is willing to budget for studies or projects which have recreation as their primary project output. In our view, recreation is like single purpose municipal and industrial water supply. It should be the responsibility of the non-Federal sector, whether that sector is private or governmental, particularly in this time of budget austerity. We feel we must concentrate available funds on flood control and commercial navigation, which have historically been, and continue to be, the central focus of the Army Corps of Engineers Civil Works program.

Senator JOHNSTON. Has the Administration made a pre-determination that certain types of projects will not be afforded priority attention even though they have comparative economic worth or rate of return compared to other project purposes?

Mr. DAWSON. As I indicated earlier, we do not consider the benefit-cost ratio or the economic return of a project to be the sole basis for determining budgetary priorities. We look at the nature of project output themselves. We do not give the same priority to all project outputs, regardless of the economic merit of a particular proposal.

Senator JOHNSTON. Will projects where sponsors are seeking adjustments under "the ability to pay" provisions be afforded the same chance to compete as any other project?

Mr. Dawson. We are developing procedures which will enable us to identify projects where sponsors should be granted relief from the standard cost sharing requirements for flood control. We are tentatively thinking that the focus will be on certain sponsors in low income states. This means that high per capita income communities and communities in States with high per capita income would not qualify. We believe that high income states should be called upon to assist a particular community within that state unable to pay the normal cost share. The communities we identify under this procedure would become candidates for reductions in the level of cost sharing under the Ability to Pay provision. Even in these cases, however, a healthy benefit cost ratio should simply imply that additional income is going to accrue to the beneficiaries, income that could be used to pay the normal share of costs. Thus for a project sponsor to be relieved of normal cost sharing responsibilities, we would take a careful look at the magnitude and incidence of the benefits produced by the project. It would be premature to make an assessment of the number of projects that might qualify for some cost sharing relief. We believe that Congress intended that relief be granted under Sec. 103 (m) only in exceptional circumstances, since it made the normal non-Federal cost sharing requirement substantially less than full cost in every case, and in many cases, increased the share by only 5 percentage points above the traditional formula.

## ABILITY TO PAY

Senator JOHNSTON. As the person responsible for instituting this provision of the new law, can you explain the meaning of:

(1) "ability to pay"?
(2) "subject to ability to pay"?

Mr. Dawson. "Ability to pay" is a measure of the resources available to local project areas and their states that can be used to pay the non-Federal share of Flood Control and Agricultural Water Supply Projects.

The phrase "subject to [the] ability [of a non-Federal interest] to pay" gives the Secretary the authority to determine a region's ability to pay and use this as a basis for reducing the non-Federal share of Flood Control and Agricultural Water Supply projects below the level that would normally be required under the terms of P.L. 99-662.

Senator JOHNSTON. What criteria and procedures will be used in determining one's ability to pay? Timetable for getting the procedures in place?

Mr. Dawson. We are tentatively thinking that the focus will be on certain sponsors in low income states. This means that high per capita income communities and communities in states with high per capita income would not qualify. We believe that high income states should be called upon to assist a particular community within that state unable to pay the normal cost share. The communities we identify under this procedure would become candidates for reductions in the level of cost sharing under the Ability to Pay provision. Even in these cases however, a healthy benefit cost ratio should imply that additional income will accrue to the beneficiaries, income that could be used to pay the normal non-Federal share of the costs. Thus for a project sponsor to be relieved of normal cost sharing responsibilities, we would take a careful look at the magnitude and incidence of the benefits produced by the project. We hope to have a preliminary methodology developed and ready for public review within the next few months.

Senator JOHNSTON. Is this a procedure within the Adminstration plans to use freely?

Mr. DAWSON. The standards will be strict. We believe that Congress intended that relief be granted under Section 103(m) only in exceptional circumstances, since it made the normal non-Federal cost sharing requirement substantially less than full cost in every case, and in many cases, increased the share by only 5 percentage points above the traditional formula which required that locals provide all lands, easements, rights of way, and relocation areas.

Senator JOHNSTON. How will projects reviewed under the ability to pay provision compete in the budget process?

Mr. DAWSON. The ability to pay test will be put on a separate tract from budgetary considerations, so that, it will not affect project priorities. By increasing the sufficient funds available for the marginal projects (the same projects that would be "marginal" without an ability to pay test). The merits of projects are generally a function of project benefits rather than the Federal share of project costs. The magnitude of the benefits compared to the project cost is an important criterion in budgetary consideration.

Senator JOHNSTON. How does this "ability to pay" provision apply to feasibility studies and pre-construction engineering and design under the General Investigation account?

Mr. DAWSON. There will be no "ability to pay" cost sharing reductions to feasibility studies, since study cost sharing is not addressed in Section 103. The preconstruction engineering and design cost sharing will be on the same basis as construction. Therefore, the reductions applied to construction cost sharing under ability to pay will also be applied to pre-construction engineering and design.

New Cost-Sharing Rules and Guidance

Senator JOHNSTON. Mr. Dawson, what were the major cost-sharing changes made by PL 99-662 and how will these changes impact on the Corps' ability to move ahead on the 29 new starts for 1987? General Heiberg, would you care to comment?

Mr. DAWSON. I will address this question. The legislation provides for non-Federal cost sharing for navigation ports and harbors, and a port user fee of 0.04 percent of the value of commerce, to cover a portion of operations and maintenance expenses. Inland waterway improvements are to be shared 50% from the inland waterways trust fund and 50% from the Treasury, with a doubling of the current ten cents per gallon fuel tax by the year 1995. Specific cost sharing formulas were legislated for flood control, including a 5% cash requirement, and minimum and maximum limitations on non-Federal contributions. Other purposes were not significantly modified, except agricultural water supply, which was provided for the first time in legislation for the Corps, requiring 35% non-Federal cost sharing. As to the question as how will these changes impact on the Corps' ability to move ahead on the new starts for 1987, the District Commanders are currently negotiating and drafting local cooperation agreements with the respective local sponsors. We expect to draft and execute agreements on as many as 25 of the projects funded by the FY 1987 Continuing Appropriation Act. We will be able to move ahead on these new starts based on our experience on the 41 new starts authorized and funded by the FY 1985 Supplemental Appropriations Act. Out of 41 FY 1985 Supplemental New Starts, only 33 required local cooperation agreements to be executed by 30 June 1986. We were successful in executing 32 out of 33 of those local cooperation agreements.

Senator JOHNSTON. Specifically, will rules and regulations be needed before negotiation, and of course construction, can proceed on the new projects? Can you give the Committee an idea of the type of thing the regulations will cover? What is your timetable for having the guidance in place?

Mr. DAWSON. Policy guidance on procedures and responsibilities for developing, submitting and obtaining approval of local cooperation agreements for new start construction projects was drafted and provided to our field offices in December 1986. Final draft guidance will be provided to the field offices in conjunction with a series of workshops to explain the provisions of PL 99-662 and to discuss the FY 1987 New Construction Starts. These workshops are being held in various locations during the months of February and March 1987. Its anticipated that the final guidance will be provided in early April 1987. The regulations cover procedures and responsibilities for developing local cooperation agreements. The regulations include guidance on development, drafting and negotiating local cooperation agreements, elements of the local cooperation agreement, and the sponsor's statement of financial capability.

Senator JOHNSTON. In light of Congressional approval of cost-sharing in the 1985 Supplemental and your on going work in this area over the past several years, why is this additional time required?

Mr. DAWSON. The existing local cooperation agreements on the FY 1985 Supplemental (PL 99-88) new construction starts were based on the cost sharing requirements in the Senate passed version of HR 6. The Water Resources Development Act of 1986 (PL 99-662), contains certain cost sharing provisions for navigation and flood control projects which differ from the requirements in the Senate passed version of HR 6. Additional time is required to prepare modifications to the existing local cost sharing agreement to reflect provisions in PL 99-662. Modified Local Cooperation Agreements are not required for all FY 1985 Supplemental new construction starts. Modifications are required for all commercial navigation projects and projects having a combination of recreational/commercial navigation outputs. Modifications to the local cooperation agreements on flood control projects are not normally necessary. For example, we will honor the requirement of Section 103 (a) (3) without the need for a formal change to the existing agreements. With this approach, we will be in a position to initiate construction as soon as possible without the need to make unnecessary modifications to existing agreements.

Senator JOHNSTON. Will there be any impact of the Corps' ability to move ahead early in 1987 on the 29 new starts approved in the CR?

Mr. DAWSON. We do not anticipate major impacts on the Corps' ability to move ahead early in 1987 on the new starts funded by the FY 1987 Continuing Appropriations Act. Guidance on implementation of PL 99-662 has been provided to our field office and the District Commanders are currently negotiating and drafting local cooperation agreements with respective local sponsors. We expect to draft and execute agreements on as many as 25 of the projects.

## CONSTRUCTION OBLIGATION CEILING

Senator JOHNSTON. How will the new annual obligation ceiling impact the Corps' ability to effectively and efficiently carry out the construction activities envisioned by the Congress?

General HEIBERG. The obligation ceilings do not adversely impact the construction program. To a large extent this is due to the enactment of the 1986 Water Resources Development Act, and its cost sharing provisions as well as its provision for automatic increases in the ceiling each fiscal year. Currently, the federal share of Construction, General, funds total some 84% of total project costs. This is expected to reduce to a 70-75% level over time as cost sharing requirements apply to a greater number of projects. Reductions in federal funding, coupled with the annual increase of $100 million in the obligation ceiling, should permit the maintenance of a responsive new starts program, given the low inflation rate now being experienced.

Senator JOHNSTON. What is the obligation ceiling for 1988 and what levels of obligations are estimated in the President's budget for Fiscal Year 1988?

General HEIBERG. The obligation ceiling for Fiscal Year 1988 is $1.5 billion. We estimate that we will obligate $1.4 billion or approximately $100 million less than the obligation ceiling for Fiscal Year 1988.

Senator JOHNSTON. Mr. Dawson, will you use this obligation ceiling to delay or otherwise block unbudgeted Congressional add-ons?

Mr. DAWSON. No. The Corps will continue to review unbudgeted additions and, as I have for several years, I will report to the Subcommittee on the planned dispositon of all such items.

## HARBOR MAINTENANCE TRUST FUND

Question. What would be the impact on operations and maintenance requirements for the current year if projected $67 million in tax collections is not realized?

Answer. Our current year program for operation and maintenance of civil works projects is based upon the Fiscal Year 1987 Continuing Resolution Appropriation (CRA) of $1,389,846,000. The $67 million in estimated collections during the year is intended to replace allocations of the CRA funds by a like amount. Therefore, if the entire $67 million is collected, we would only allocate up to $1,322,846,000 in Federal funds, provided the Supplemental Appropriation Act allows the use of the collected funds. If, for example, only $30 million is collected, we would use up to $1,359,846,000 of the CRA funds. In any event there would be no change in the scope or quality of the performance of Operation and Maintenance activities during Fiscal Year 1987.

Question. Would there be any adverse impact if the proposed supplemental language under Operation and Maintenance, General, were not provided?

Answer. Failure to provide the proposed language would result in financing the entire Fiscal Year 1987 Operation And Maintenance program with CRA Federal funds rather than using collected funds to help cover the costs. However, as stated in the previous answer, there would be no change in the performance of Operation and Maintenance work.

Question. What percentage of the costs of operating and maintaining commercial navigation facilities does the $149.2 million represent?

Answer. In accordance with Section 210 of the Water Resources Development Act of 1986, PL 99-662, not more than 40 percent of the eligible operations and maintenance costs assigned to commercial navigation of all harbors and inland harbors may be appropriated out of the Harbor Maintenance Trust Fund. Section 1402 (a) defines applicable navigation facilities subject to collection of the Harbor Maintenance Tax. Our estimate of costs to operate and maintain such facilities, included in the Fiscal Year 1988 Budget, is around $450 million; of this amount, $149.2 million would represent about 35 percent. You may note, therefore, that the $149.2 million is based on estimated collections during the first full year of implementation.

Senator JOHNSTON. Why should the Federal Government provide Construction funding in advance of a binding agreement or financing package being in place?

Mr. Dawson. We appreciate the Committee's concern about providing construction funds in advance of binding local cost sharing agreements. Although it may appear that we are requesting funds before all the project details are worked out with the project sponsor, such is not really the case.

Appropriations for new construction starts over the last several fiscal years were contingent upon increased cost sharing by non-Federal interests. Unfortunately, formulation of those projects were not subject to the efficiencies of the cost sharing criteria embodied in the Water Resources Development Act of 1986. Accordingly, the increased share of the project costs have caused sponsors to reexamine the scope and level of project output relative to their current financial commitments and priorities. It is this reevaluation that has caused a delay in implementing some of the Fiscal Year 1985 and the Fiscal Year 1987 new construction starts. We are finding that the bigger projects, are being scaled back, either in their scope, or output or by a deferral of a project feature or element. However, this is expected to be an interim situation. Cost sharing of the study and preconstruction engineering and design phases has assured a strong participatory role by the sponsor; one that will help assure that the project authorized and designed will be implemented. Moreover, starting with the Fiscal Year 1988 budget, District Commanders are being asked to initiate negotiations and develop a draft Local cooperation Agreement once the project is approved for inclusion in the President's budget. However, no agreement would be signed until Congress has indicated its concurrence with the project through appropriation of construction funds.

Appropriation of funds to initiate construction also help provide the sponsor some of the leverage needed to acquire its share of funds. The appropriations are evidence of the Federal government's commitment to construct the project to the state, the financial community and the general public. This in turn enhances the sponsor's ability to obtain the financial assistance necessary to provide the lands, easements, rights-of-way, and relocations normally required prior to the expenditure of any Federal funds.

# ARMY CIVIL WORKS PROGRAM
# FY 1988 NEW STARTS: CONSTRUCTION
# ELIGIBILITY, PRELIMINARY SELECTION, PRIORITIZATION AND SELECTION CRITERIA

## ELIGIBILITY CRITERIA

1. Project is authorized for construction, or favorably recommended for implementation in a feasibility study with the Chief of Engineers pre-authorization report complete by 2 May 1986.
2. Project has net NED benefits at applicable interest rate, unless project authorization was not based upon formal benefit/cost evaluation.
3. Preconstruction planning fully funded by 30 September 1987.

## PRELIMINARY SELECTION CRITERIA

1. Appropriate evaluation of project merits contained in Corps report.
2. Project is in compliance with the applicable environmental statutes, appropriate to the current stage of implementation.
3. Phase I GDM, Combined GDM, or Reevaluation Report approved by 1 July 1986.
4. Project cost and benefit estimates are firm, and when estimates are based on Phase II GDM studies, the Phase II GDM scheduled for approval by 1 August 1987.
5. If postauthorization change required, only routine issues involved.
6. No known or reasonably anticipated conditions or unresolved issues exist which might prevent project from being placed under construction by 30 June 1988.
7. Draft of Environmental Impact Statement (EIS) or supplement to be filed with EPA by 1 September 1986. Final EIS or supplement scheduled for filing with EPA by 1 August 1987 unless the project is subject to Section 404(r). If a section 404(b)(1) evaluation is required, the final EIS or supplement which contains the evaluation is scheduled to be filed with EPA by 1 May 1987.

## PRIORITIZATION CRITERIA

Priority Group 1. - Projects with a benefit - cost ratio (BCR) greater than 1.0 at the current interest rate when only the mainline benefits of hydropower, M&I/AG water supply, commercial navigation, and flood damage reduction are considered.

Priority Group 2. - Projects with a BCR greater than 1.0 at the current interest rate when all benefits are considered, provided a significant amount (over 20 percent) of the benefits are in the mainline categories listed above.

Priority Group 3. - All other projects.

## SELECTION CRITERIA (FOR PROJECT RECOMMENDATION)

1. Project: (a) meets the ELIGIBILITY AND PRELIMINARY SELECTION CRITERIA; (b) is in Priority Group 1 and/or 2 indicated above; (c) Federal involvement in implementation is warranted; or (d) other special conditions apply. For a project which provides M&I water supply, Federal involvement is warranted when either (1) the benefits attributable to the other mainline outputs of flood control, commercial navigation, and/or agricultural water supply are equal to or greater than 20% of the total benefits, or (2) if the other mainline benefits are between 10 and 20% of the total benefits, and the storage for those benefits is economically justifiable on an incremental, last-added basis.

2. Project sponsor has indicated willingness to meet the Department of the Army's cost sharing guidelines.

Senator JOHNSTON. Was the B/C ratio used as the final determining factor? as the ability to pay provision used in the selection process?

Mr. Dawson. No, it was not the final determining factor. However, to be eligible for consideration the projects in the final array had to have a benefit cost ratio equal to or greater than unity. The ability to pay provision was not used in the selection process. All the eligible projects were assumed to have willing cost-sharing sponsors.

Senator JOHNSTON. How did the Administration handle projects in economically depressed regions?

Mr. DAWSON. Under certain conditions, the economic effects of the direct use of otherwise unemployed or underemployed labor resources during project construction or installation is included as a benefit to the project and is reflected in the project's overall benefit cost ratio.

Senator JOHNSTON. Were all of the projects which passed the Administration's test using a 10% rate of return included in the budget? If not, provide a complete list for the record.

Mr. DAWSON. Mr. Chairman, all the projects that we have recommended for a construction new start met the 10% rate of return test. However, we reviewed a number of projects which were eligible for consideration and also had benefit/cost ratio greater than 1.0 at the 10% discount rate, but which for various reasons were not included in the budget. I will provide for the record a table listing these projects

| PROJECT NAME | STATE |
|---|---|
| Hannibal | MO |
| Presque Isle | PA |
| Meramec River Basin | MO |
| L'Anguille River | AR |
| Mississippi Delta Region | LA |
| Big & Little Sallisaw Creeks | OK |
| Bethel Bank Stabilization | AK |

Senator JOHNSTON. Also provide for the record a list of all of those projects which meet the Administration's criteria using the 8 7/8% discount rate.

Mr. DAWSON. With your permission Mr. Chairman, I would like to include for the record a table that shows the eligible construction new starts for FY 1988.

[The information follows:]

### ARMY CIVIL WORKS PROGRAM
### FY 1988 NEW STARTS: CONSTRUCTION
### ELIGIBILITY LIST

| AUTH | DIV | PROJECT NAME (TYPE) | STATE | MAJOR OUTPUT |
|---|---|---|---|---|
| A | NED | TOWN BROOK, QUINCY (DT/R/L/CI) | MA | UF |
| A | NAD | RICHMOND FILTRATION PLANT (FW) | VA | UF |
| A | NAD | TAMAQUA (DT) | PA | UF |
| A | SAD | CHARLESTON HARBOR DEEPENING (H) | SC | DH |
| A | SAD | INDIAN RIVER COUNTY (BE) | FL | GR |
| A | SAD | MANATEE HARBOR (H) | FL | DH |
| A | SAD | RANDLEMAN LAKE (R) | NC | M&I |
| A | SAD | SAVANNAH RIVER, OATES CREEK (CI) | GA | UF |
| A | SAD | VILLAGE CREEK (NS/CI) | AL | UF |
| A | ORD | LOGAN LPP (CI/L) | OH | UF |
| A | ORD | NELSONVILLE LPP (CI) | OH | UF |
| A | NCD | BEAVER BAY HARBOR (H) | MN | HRF |
| A | NCD | CEDAR RIVER HARBOR (H) | MI | RB/SD |
| A | NCD | CHASKA (CI/L) | MN | UF |
| A | NCD | DANSVILLE (L/CI) | NY | UF |
| A | NCD | DAVENPORT (CI) | IA | UF |
| A | NCD | EAST GRAND FORKS (L/NS/LA) | MN | UF |
| A | NCD | HANNIBAL (L) | MO | UF |
| A | NCD | KNIFE RIVER HARBOR (H) | MN | DC |
| A | NCD | LUTSEN HARBOR (H) | MN | HRF |
| A | NCD | MOLINE (L/FW) | IL | UF |
| A | NCD | NORTH BRANCH CHICAGO RIVER (R/DS) | IL | UF |
| A | NCD | PRESQUE ISLE (BE/BW) | PA | MOD |
| A | NCD | RENO BEACH - HOWARD FARMS AREAS (FW) | OH | UF/RF |
| A | NCD | SAVANNA, S. B. HARBOR (H) | IL | RB |
| A | NCD | STATE ROAD AND EBNER COULEES (CI) | WI | UF |
| A | LMV | MERAMEC RIVER BASIN (L/NS) | MO | UF |
| A | MRC | HARRIS FORK CREEK, TN & KY (CI) | TN | UF |
| A | MRC | L'ANGUILLE RIVER (CI) | AR | RF |
| A | MRC | MISSISSIPPI DELTA REGION (DS) | LA | F&W |
| A | SWD | ALAMOGORDO (CI) | NM | UF |
| NA | SWD | ARK-RED R BASINS CHLOR(REM RED)(R/WQ) | OK/TX | M&I/AG |
| A | SWD | BIG & LITTLE SALLISAW CREEKS (CI/H) | OK | IW |
| A | SWD | FOUNTAIN CREEK AT PUEBLO (CI/L) | CO | UF |
| A | SWD | MINGO CREEK (CI) | OK | UF |
| A | SWD | PARKER LAKE (R) | OK | M&I |
| A | SWD | PUERCO RIVER, GALLUP (LA) | NM | UF |
| A | SWD | RIO GRANDE FLDWY(TRUTH OR CONSEQ)(R) | NM | UF |
| A | MRD | WESTERLY CREEK (CI) | CO | UF |

## ARMY CIVIL WORKS PROGRAM
## FY 1988 NEW STARTS: CONSTRUCTION
## ELIGIBILITY LIST

| AUTH | DIV | PROJECT NAME (TYPE) | STATE | MAJOR OUTPUT |
|---|---|---|---|---|
| A | NPD | BETHEL BANK STABILIZATION (BS) | AK | UF |
| A | NPD | BONNEVILLE POWER UNITS, OR & WA (L&D) | OR | HP |
| A | NPD | CHETCO RIVER (CI) | OR | SD |
| A | NPD | JOHNSON CREEK (CI) | OR | UF |
| A | NPD | KAKE HARBOR (H/BW) | AK | SD |
| A | NPD | PENINSULA DRAINAGE DIST NO. 2 (CI) | OR | UF |
| A | NPD | STRUBE LAKE & COUGAR ADD'L UNITS (R) | OR | HP |
| A | NPD | ZINTEL CANYON DAM (R) | WA | UF |
| A | SPD | OAKLAND INNER HARBOR (CI) | CA | DH |
| A | SPD | RICHMOND HARBOR (H) | CA | DH |
| A | SPD | SAN LUIS REY RIVER (CI/L) | CA | UF |
|  | POD | (NONE) |  |  |

NOTE: Additional output shown when it provides over 20% of benefits or has a potential for requiring an additional sponsor for cost sharing.

### LEGEND

#### Project Type

BE - Beach Erosion
BS - Bank Stabilization
BW - Breakwater
CI - Channel Improvement
DS - Freshwater Diversion Structure
DT - Diversion Tunnel
FW - Floodwall
H - Harbor
L - Levee
LA - Land Acquisition
L&D - Lock and Dam
NS - Non-Structural
R - Reservoir
WQ - Water Quality Infrastructure

#### Major Output

AG - Agricultural Water Supply
DC - Deficiency Correction
DD - Commercial Navigation - Deep Draft Over 45'
DH - Commercial Navigation - Deep Draft
F&W - Fish and Wildlife Mitigation or Enhancement
GR - General Recreation
HP - Single Purpose Hydroelectric Power
HRF - Harbor of Refuge
IW - Inland Waterway
M&I - Municipal and Industrial Water Supply
MOD - Project Modification
RB - Recreational Boating
RF - Rural Flood Damage Reduction
SD - Commercial Navigation - Shallow Draft
UF - Urban Flood Damage Reduction

## PROGRESS ON 1985 AND 1987 NEW CONSTRUCTION STARTS

Senator JOHNSTON. How many of the 41 projects contained in the 1985 Supplemental have actually been started? How about those in the 1987 Continuing Resolution?

Mr. Dawson. Ten of the FY 1985 Supplemental Appropriations Act new starts and one of the FY 1987 Appropriations Act new starts have actually started construction.

## FY 1985 SUPPLEMENTAL AND FY 1987 NEW CONSTRUCTION STARTS

Senator JOHNSTON. On page 4 of your statement, Mr. Dawson, you refer to 60 projects started during the period 1985 through 1987. Why is this figure different from the 70 projects (41 in the 1985 Supplemental and 29 in 1987 Continuing Resolution) the Congress has approved?

Mr. Dawson. My statement refers to the fact that the FY 1988 budget request included funds for 60 of the new start projects funded by the FY 1985 Supplemental Appropriations Act and the FY 1987 Appropriations Act. I will provide for the record a list of those projects on which we are not proceeding, together with the reasons for not moving these projects to construction.

[The information follows:]

Cape May Inlet to Lower Township, NJ

The project is for beach erosion protection, beach restoration, and periodic nourishment, primarily to provide additional recreational opportunities and to replace land lost due to shoreline erosion. Federal water projects designed primarily to provide recreation opportunities are not in agreement with present budget priorities. A reevaluation of the plan recommended in the General Design Memorandum is underway which may result in a revised project plan that is implementable in accordance with current policies.

Cross Florida Barge Canal, FL - Land Acquisition

The project is for land acquisition primarily to establish a conservation management area and to provide additional recreation opportunities. We believe that the establishment and management of such an area should be a non-federal activity; particularly since non-federal interests own the land in question.

Miami Harbor, FL - Cleanup

The cleanup project is for removal of polluted sediments from the Miami River bottom. The ongoing feasibility study for Miami Harbor River sediment removal is scheduled for completion in FY 1987. The Chief of Engineers's report on this study will serve as the basis of the review required by Section 903a of the Water Resources Development Act of 1986, Public Law 99-662, before this project may be considered for construction.

Randleman Lake, NC

The project is for municipal and industrial water supply, flood control, and recreation. The economics of the project are under review to determine whether a multipurpose project can be justified which complies with current policy for Federal participation in the construction of water projects.

Silver Bay Harbor of Refuge, MN

The project is for a harbor of refuge primarily for recreation boats. Federal water projects designed primarily to provide recreational opportunities are not in agreement with the present budget priorities.

Red Rock Dam - Lake Red Rock, IA - Land Acquisition

There is concern that lake operations over the years have been such that lands on which flowage easements were obtained are being flooded more frequently than originally intended. The project is for additional land acquisition in fee from willing sellers. A real estate design memorandum is being prepared to determine the extent of Federal interest in and justification for additional land acquisition.

Missouri National Recreation River, NE and SD

The project outputs are primarily recreational. Federal water projects designed primarily to provide recreational opportunities are not in agreement with present budget priorities.

Des Moines Recreation River and Greenbelt, IA

The project outputs are primarily recreational. Federal water projects designed primarily to provide recreational opportunities are not in agreement with the present budget priorities.

Cleveland Harbor, OH

The project is for modification of a deep draft commercial harbor. The non-Federal sponsor declined to execute a local cooperation agreement for this FY 1985 Supplemental Appropriations Act new construction start.

Gulfport Harbor, MS

The project is for modification of a deep draft commercial harbor. Engineering and design has not progressed to a point where a local cooperation agreement can be executed and construction initiated for this FY 1985 Supplemental Appropriations Act new construction start. The project is included in the FY 1988 budget for preconstruction planning and design and will be considered for construction after PED is completed in FY 1989.

Parker Lake, OK

The feasibility report for this project revealed that it was essentially a single-purpose water supply project. A reanalysis of the project benefits was recently completed and is currently with the Bureau of Reclamation for comments, since the reanalysis indicated some of the benefits could be agricultural water supply. We are presently continuing to work on the advance engineering and design for the project. The Assistant Secretary of the Army for Civil Works plans to review the benefit reanalysis and any Bureau of Reclamation comments and determine whether the project should proceed to construction.

Senator JOHNSTON. Provide a table for the record which shows, by project, the project purpose, status of local cost - sharing agreement, status of local sponsor financing package, and funds obligated to date on each. Also provide the reason, if applicable, why construction is not proceeding or funds have not been used on any project.

Mr. Dawson. I will provide the requested tables for the records.

(The information follows.)

FY 1985 SUPPLEMENTAL AND FY 1987 CONSTRUCTION NEW STARTS

7 MAR 87

| NO (1) | DIV (2) | FY 85S OR FY 87 NEW START (3) | PROJECT (4) | FY 88 BUD AMT $000 (5) | PRIMARY PROJECT PURPOSE (6) | ACT/SCHED LCA EXCTN MO/YR (7) | ACT/SCHED FIN PLN APPV MO/YR (8) | ACT/SCHED CONST START MO/YR (9) | ACT FY 87 OBG THRU 31 JAN 87 $000 (10) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | LMV | 5 | LOCK AND DAM 26, SECOND LOCK, IL & MO | 4,000 | N | NOT REQD | NOT REQD | MAY 89 | 2,129 |
| 2 | LMV | 5 | MISSISSIPPI RIVER SHIP CHANNEL, GULF TO BATON ROUGE, LA | 8,300 | N | JUN 86 | APR 87 | JUL 87 | 272 |
| 3 | LMV | 5 | PEARL RIVER, ST. TAMMANY PARISH, LA | 210 | FC | JUN 86 | MAR 87 | MAY 90 | 84 |
| 4 | MRD | 7 | MISSOURI NATIONAL RECREATIONAL RIVER, NE & SD | 100 | R | JUN 86 | JUN 86 | MAR 87 | 11 |
| 5 | MRT | 5 | ATCHAFALAYA BASIN FLOODWAY SYSTEM | 3,500 | FC | NOT REQD | NOT REQD | JAN 88 | 107 |
| 6 | MRT | 5 | EIGHT MILE CREEK | 450 | FC | NOT SCHED | NOT SCHED | MAR 90 | 110 |
| 7 | NAD | 5 | ARDSLEY, NY | 1,300 | FC | JUN 86 | FEB 87 | SEP 87 | 63 |
| 8 | NAD | 5 | BALTIMORE HARBOR AND CHANNELS, MD & VA (50-FT DEEPENING) | 47,000 | N | JUN 86 | DEC 86 | FEB 87 | 63 |
| 9 | NAD | 5 | BARNEGAT INLET, NJ | 6,000 | N | MAY 86 | FEB 87 | APR 87 | 31 |
| 10 | NAD | 7 | CAPE MAY INLET TO LOWER TOWNSHIP, NJ | 0 | R | NOT SCHED | NOT SCHED | NOT SCHED | 1 |
| 11 | NAD | 5 | COWANESQUE LAKE, PA (MODIFICATION) | 138 | FC | JUN 86 | SEP 86 | APR 87 | 1 |
| 12 | NAD | 7 | DELAWARE RIVER VICINITY OF CAMDEN, NJ | 0 | N | APR 87 | AFR 87 | JUN 87 | 0 |
| 13 | NAD | 7 | FRANCIS E. WALTER DAM, PA (MODIFICATION) | 3,900 | FC | MAR 87 | MAR 87 | SEP 87 | 88 |
| 14 | NAD | 5 | KILL VAN KULL AND NEWARK BAY CHANNEL, NY & NJ | 52,000 | N | MAY 86 | FEB 87 | APR 87 | 126 |
| 15 | NAD | 5 | LIBERTY STATE PARK LEVEE AND SEAWALL, NJ | 6,000 | R | JUN 86 | JAN 87 | FEB 87 | 27 |
| 16 | NAD | 5 | MORICHES INLET, NY | 3,609 | N | JUN 86 | FEB 87 | MAR 87 | 8 |
| 17 | NAD | 5 | NORFOLK HARBOR AND CHANNELS, VA (55-FT DEEPENING) | 12,165 | N | MAY 86 | DEC 86 | FEB 87 | 87 |
| 18 | NAD | 5 | RICHMOND, VA | 10,000 | FC | JUN 86 | APR 87 | JUN 87 | 291 |
| 19 | NAD | 7 | TAMAQUA, PA | 3,000 | FC | MAR 87 | MAR 87 | AUG 87 | 5 |
| 20 | NAD | 5 | VIRGINIA BEACH STREAMS, CANAL NO. TWO, VA | 2,000 | FC | APR 86 | MAY 86 | MAY 87 | 7 |
| 21 | NCD | 5 | BASSETT CREEK, MN | 3,600 | FC | JUN 86 | AUG 86 | MAY 87 | 284 |
| 22 | NCD | 7 | CLEVELAND HARBOR, OH | 0 | N | NOT SCHED | NOT SCHED | NOT SCHED | 1 |
| 23 | NCD | 7 | DES MOINES RECREATION RIVER AND GREENBELT, IA | 0 | R | NOT SCHED | NOT SCHED | NOT SCHED | 111 |
| 24 | NCD | 5 | ELLICOTT CREEK, NY | 4,240 | FC | FEB 84 | JUN 86 | SEP 86 | 158 |
| 25 | NCD | 5 | GENEVA-ON-THE-LAKE, OH | 1,487 | N | JUN 86 | AUG 86 | OCT 86 | 114 |
| 26 | NCD | 5 | PORT ONTARIO, NY | 500 | N | JUN 86 | JUL 86 | APR 87 | 45 |
| 27 | NCD | 7 | RED ROCK DAM - LAKE RED ROCK, IA | 0 | FC | NOT SCHED | NOT SCHED | NOT SCHED | 0 |
| 28 | NCD | 7 | SILVER BAY HARBOR, MN | 0 | N | NOT SCHED | NOT SCHED | NOT SCHED | 0 |
| 29 | NCD | 7 | SOUTH FORK ZUMBRO RIVER AT ROCHESTER, MN | 3,000 | FC | MAY 87 | JUN 87 | OCT 87 | 64 |
| 30 | NCD | 7 | SOUTH QUINCY LEVEE AND DRAINAGE DISTRICT, IL | 2,500 | FC | MAY 87 | JUN 87 | OCT 87 | 37 |
| 31 | NCD | 5 | UPPER MISS RVR SYSTEM ENVIR MGMT PROGRAM, IL, IA, MO, MN, & WI | 4,168 | FWL | JUN 86 | AUG 86 | OCT 86 | 5.191 |
| 32 | NED | 5 | JONESPORT HARBOR, ME | 4,340 | N | JUN 86 | MAR 87 | APR 87 | 8 |
| 33 | NED | 7 | PORTSMOUTH HARBOR AND PISCATAQUA RIVER, NH & ME | 7,500 | N | JUL 87 | JUL 87 | AUG 87 | 9 |
| 34 | NED | 7 | REVERE BEACH, MA | 2,450 | BE | JUN 87 | JUN 87 | JUL 87 | 8 |
| 35 | NED | 7 | TOWN BROOK, QUINCY AND BRAINTREE, MA | 6,800 | FC | JUL 87 | JUL 87 | AUG 87 | 30 |

FY 1985 SUPPLEMENTAL AND FY 1987 CONSTRUCTION NEW STARTS

7 MAR 87

| NO (1) | DIV (2) | FY 85S OR FY 87 NEW START (3) | PROJECT (4) | FY 88 BUD AMT $000 (5) | PRIMARY PROJECT PURPOSE (6) | ACT/SCHED LCA EXCTN MO/YR (7) | ACT/SCHED FIN PLN APPV MO/YR (8) | ACT/SCHED CONST START MO/YR (9) | ACT FY 87 OBG THRU 31 JAN 87 $000 (10) |
|---|---|---|---|---|---|---|---|---|---|
| 43 | SAD | 5 | DADE COUNTY, NORTH OF HAULOVER BEACH PARK, FL | 2,534 | BE | JUN 86 | APR 87 | SEP 87 | 1 |
| 44 | SAD | 7 | GULFPORT HARBOR, MS | 0 | N | NOT SCHED | NOT SCHED | NOT SCHED | 331 |
| 45 | SAD | 7 | JACKSONVILLE HARBOR, MILL COVE, FL | 2,968 | N | NOT REQD | NOT REQD | JUL 87 | 23 |
| 46 | SAD | 7 | MIAMI HARBOR (CLEANUP), FL | 0 | N | NOT SCHED | NOT SCHED | NOT SCHED | 0 |
| 47 | SAD | 5 | MOBILE HARBOR, AL | 16,200 | N | JUN 86 | JAN 87 | JUN 87 | 121 |
| 48 | SAD | 7 | PONCE HARBOR, PR | 6,203 | N | JUN 87 | JUN 87 | JUL 87 | 6 |
| 49 | SAD | 7 | RANDLEMAN LAKE, NC | 0 | WS | NOT SCHED | NOT SCHED | NOT SCHED | 6 |
| 50 | SAD | 5 | SAVANNAH HARBOR, GA | 2,800 | N | JUN 86 | FEB 87 | JUL 87 | 135 |
| 51 | SAD | 7 | SOWASHEE CREEK, MS | 6,000 | FC | APR 87 | APR 87 | AUG 87 | 7 |
| 52 | SAD | 5 | TAMPA HARBOR BRANCH CHANNELS, FL | 0 | N | JUN 86 | MAR 87 | MAY 87 | 74 |
| 53 | SAD | 7 | THREEMILE CREEK, AL | 5,000 | FC | MAR 87 | MAR 87 | JUN 87 | 13 |
| 54 | SAD | 7 | VILLAGE CREEK, AL | 8,000 | FC | MAY 87 | MAY 87 | JUL 88 | 3 |
| 55 | SAD | 5 | WILLIAM BACON OLIVER LOCK AND DAM, AL | 22,000 | N | NOT REQD | NOT REQD | FEB 87 | 1,634 |
| 56 | SPD | 5 | FAIRFIELD VICINITY STREAMS, CA | 3,900 | FC | JUN 86 | JUL 86 | APR 87 | 182 |
| 57 | SPD | 5 | LITTLE DELL LAKE, UT | 5,500 | FC | JUN 86 | MAR 87 | MAY 88 | 315 |
| 58 | SPD | 5 | MERCED COUNTY STREAMS, CA | 2,400 | FC | JUN 86 | APR 87 | MAY 87 | 198 |
| 59 | SPD | 7 | OAKLAND OUTER HARBOR, CA | 6,500 | N | SEP 87 | SEP 87 | DEC 87 | 146 |
| 60 | SPD | 7 | PAJARO RIVER, CA | 1,865 | FC | JUN 87 | JUN 87 | JUN 87 | 10 |
| 61 | SPD | 7 | REDBANK AND FANCHER CREEK, CA | 1,900 | FC | JUL 87 | JUL 87 | APR 88 | 36 |
| 62 | SPD | 5 | RICHMOND HARBOR, CA | 900 | N | JUL 87 | JUL 87 | JUN 88 | 0 |
| 63 | SPD | 5 | SACRAMENTO RIVER DEEPWATER SHIP CHANNEL, CA | 11,000 | N | JUN 86 | MAR 87 | MAY 87 | 72 |
| 64 | SPD | 7 | SAN LUIS REY RIVER, CA | 8,500 | FC | JUN 87 | JUN 87 | JUN 87 | 3 |
| 65 | SWD | 5 | BOGGY CREEK, AUSTIN, TX | 8,200 | FC | JUN 86 | AUG 86 | APR 87 | 146 |
| 66 | SWD | 5 | CLEAR CREEK, TX | 4,800 | FC | JUN 86 | AUG 86 | OCT 87 | 314 |
| 67 | SWD | 7 | FOUNTAIN CREEK AT PUEBLO, CO | 2,500 | FC | JUL 87 | JUL 87 | AUG 87 | 21 |
| 68 | SWD | 7 | FOURCHE BAYOU BASIN, LITTLE ROCK, AR | 2,300 | FC | JUL 87 | JUL 87 | SEP 87 | 31 |
| 69 | SWD | 5 | FREEPORT HARBOR, TX | 11,400 | N | JUN 86 | MAR 87 | APR 87 | 49 |
| 70 | SWD | 7 | GREAT BEND, KS | 1,600 | FC | JUN 87 | JUN 67 | JUL 87 | 107 |
| 71 | SWD | 7 | HALSTEAD, KS | 500 | FC | SEP 87 | SEP 87 | AUG 88 | 3 |
| 72 | SWD | 7 | LAKE WICHITA, HOLLIDAY CREEK AT WICHITA FALLS, TX | 1,500 | FC | JUN 87 | JUN 87 | SEP 87 | 33 |
| 73 | SWD | 7 | PARKER LAKE, OK | 0 | WS | NOT SCHED | NOT SCHED | NOT SCHED | 145 |
| 36 | NPD | 5 | BONNEVILLE NAVIGATION LOCK, OR & WA | 40,000 | N | NOT REQD | NOT REQD | MAY 86 | 10,185 |
| 37 | NPD | 7 | MT. ST. HELENS SEDIMENT CONTROL, WA | 50,000 | FC | APR 86 | APR 86 | SEP 86 | 19,053 |
| 38 | ORD | 5 | GALLIPOLIS LOCKS AND DAM, WV & OH | 8,000 | N | NOT REQD | NOT REQD | MAY 86 | 1,221 |
| 39 | POD | 7 | AGANA RIVER, GU | 2,500 | FC | APR 87 | APR 87 | JUL 87 | 18 |
| 40 | POD | 5 | KAHOMA STREAM, MAUI, HI | 2,400 | FC | JUN 86 | JUN 86 | SEP 86 | 1,014 |
| 41 | SAD | 7 | BLACK WARRIOR AND TOMBIGBEE RIVERS, VICINITY OF JACKSON, AL | 1,350 | N | SEP 87 | SEP 87 | MAR 88 | 0 |
| 42 | SAD | 7 | CROSS FLORIDA BARGE CANAL (LAND ACQUISITION) | 0 | R | NOT SCHED | NOT SCHED | NOT SCHED | 0 |

Senator JOHNSTON. Have any projects fallen by the wayside between the signing of a letter of intent and formulation of a local financing package?

Mr. Dawson. To date, only the Cleveland Harbor project in Ohio has fallen by the wayside because the local sponsor declined to execute a local cooperation agreement.

## CARRYING OUT COMMITTEE DIRECTIONS AND INTENT AS EXPRESSED

Senator JOHNSTON. Would there be an adverse impact on your ability to efficiently manage the Civil Works Program if a major number of items were written into the Act? Please explain.

Mr. DAWSON. Overall, such a procedure by Congress would impact our ability to manage and carryout a national water resources program. We already comply with committee report language in the majority of cases and we sincerely want to do what Congress directs. In those very few cases where we do not follow report language, I think the record will show, that those activities do not follow the Administration's water resources policies. As a result, we feel compelled to bring this to the attention of Congress, and to have an opportunity to present the Administration's arguments for not proceeding. If the Administration or Congress is not swayed otherwise by this dialogue, then it is up to Congress to put it into the law.

There is one aspect of Act language that would impact our program management and delivery and that is the fencing of certain amounts of appropriated funds to do work that is not in the budget request. Let me explain. When we do not budget an activity we stop work on it and in most cases, the activity will require some lead time to get it ready to do what Congress directed. As a result we usually cannot use all the funds provided in the first year, and because these funds are fenced, they cannot be used to advance or start other activities that are ready to go. We believe that this is an inefficient use of funds, would increase our yearly unobligated carryover, and limit our ability to distribute appropriated funds over the most number of activities.

Senator JOHNSTON. Could you explain exactly what the Administration's policy is with respect to recreation development at authorized Corps projects?

Mr. Dawson. The fact that there is a cost sharing policy established for a particular project output does not necessarily mean that the Administration is willing to budget for projects producing primarily that output. When recreation is included in a multi-purpose project, the development will be cost shared on a 50/50 basis. That does not mean, however, that the Administration is willing to budget for studies or projects in separable elements of projects which have recreation as their primary project output. In our view, recreation is like municipal and industrial water supply. It should be the responsibility of the non-Federal sector, whether that sector is private or governmental, particularly in this time of budget austerity. We feel we must limit the use of our available funds to flood control and commerical navigation, which have historically been, and continue to be, the central focus of the Army Corps of Engineers Civil Works program. This was our policy prior passage of P.L. 99-662 and the new authorization Act does not alter our budgetary priorities.

Senator JOHNSTON. What about projects where some recreation development has already taken place at full Federal funding?

Mr. DAWSON. The older projects on which we undertook recreational development on the basis of full Federal funding represented completion of a transition period. We do not envision, certainly, pursuing any more recreational development at those projects at 100 percent Federal expense. We, however, are willing to continue with development on the basis of 50/50 cost sharing. This is because we do not consider recreation at multiple purpose projects to be, for programmatic purposes, a separable element. Those facilities are part of what is necessary to realize the benefits claimed for the project, and we are willing to pursue them, as I indicated, on the basis of 50/50 cost sharing.

Senator JOHNSTON. Mr. Dawson, in light of potential changes which could have some affect in this area, would you endeavor to review this matter to see if there is some flexibility in the current policy or some common understanding which you and the Committee can establish in this or other areas?

Mr. DAWSON. Our policy with regard to the transitioning from 100 percent Federal to 50/50 funding of new recreational development has been a longstanding one. It has been tested many times, and our ability to be flexible is highly constrained. It has been over 20 years now since passage of Public Law 89-72, the Federal Water Project Recreation Act, which first established 50/50 cost sharing, and I think it is really important that we have cost sharing on all future recreational facilities, regardless of when the project may have been authorized or regardless of when initiation of construction took place.

## ADMINISTRATION POLICY DEFERRALS IN OPERATION AND MAINTENANCE

Question. Are there any projects where O&M funding is being curtailed or deferred due to policy reasons? If so, provide a list of those projects for the record indicating the amount to be deferred and the policy reason for the deferral. Also indicate the amount needed in Fiscal Year 1988 to bring those projects up to an optimal level of maintenance.

Answer. All funds appropriated for Operation and Maintenance, General, in Fiscal Year 1987 are available for obligation: there are no policy deferrals. And in Fiscal Year 1988, due to budgetary limitations, we have had to prioritize our O&M work. Because of the need for work on projects with high priority outputs such as commercial navigation, flood control and hydropower, resources are not budgeted for dredging some of the low-use, commercial and recreational harbors. However, the Corps will continue to monitor channel conditions and evaluate the need for dredging as we get closer to Fiscal Year 1988. If shoaling becomes critical, we will determine if reprogramming is needed to ensure safe navigation at these projects. In addition to lower priority navigation projects, certain other items were not budgeted where the work could be accomplished in the following year without significant impacts. The unbudgeted dredging projects are listed below:

### RECREATION HARBOR MAINTENANCE REQUIREMENTS NOT FUNDED IN FISCAL YEAR 1988

| Project Name | State | Amount (Dollars) |
|---|---|---|
| Ninilchik Harbor | AK | 219,000 |
| Bayou Coden | AL | 326,000 |
| Bayou La Batre | AL | 671,000 |
| Perdido Pass Channel | AL | 119,000 |
| Milford Harbor | CT | 411,500 |
| IWW Rehoboth Bay to Delaware Bay | DE | 495,000 |
| Apalachicola Bay | FL | 400,000 |
| East Pass Channel | FL | 843,000 |
| La Grange Bayou | FL | 412,000 |
| Okeechobee Waterway | FL | 600,000 |
| Ponce De Leon Inlet | FL | 100,000 |
| Port St. Joe Harbor | FL | 1,541,000 |
| St. Lucie Inlet | FL | 90,000 |
| St. Augustine Harbor | FL | 30,000 |
| Haleiwa Small Boat Harbor | HA | 395,000 |
| Bayou Segnette Waterway | LA | 240,000 |
| Chatham (Stage) Harbor | MA | 501,500 |
| Green Harbor | MA | 339,200 |
| Newburyport Harbor | MA | 576,200 |
| Sesuit Harbor | MA | 236,100 |
| Herring Bay and Rockhold Creek | MD | 494,900 |
| Nanticoke River at Nanticoke | MD | 485,000 |
| Ocean City Harbor & Inlet & Sinepuxent bay | MD | 459,000 |
| Cadet Bayou | MS | 268,000 |
| Gulfport Harbor | MS | 461,000 |
| Pass Christian Harbor | MS | 412,000 |
| Bogue Inlet and Channel | NC | 514,000 |
| Carolina Beach Inlet | NC | 579,000 |
| Channel From Back Lound to Lookout Bight | NC | 105,000 |
| Lockwoods Folly River | NC | 589,000 |
| New River Inlet | NC | 490,000 |
| New Topsail Inlet and Connecting Channels | NC | 520,000 |
| Ocracoke Inlet | NC | 250,000 |
| Silver Lake Harbor | NC | 420,000 |
| Hampton Harbor | NH | 288,300 |
| Cohansey River | NJ | 1,405,000 |
| Manasquan River | NJ | 540,000 |
| Long Island Intracostal Waterway | NY | 715,000 |
| Coos Bay | OR | 819,000 |
| Coquille River | OR | 326,000 |
| Arecibo Harbor | PR | 40,000 |

| Project Name | State | Amount (Dollars) |
|---|---|---|
| Block Island Harbor of Refuge | RI | 117,000 |
| Great Salt Pond - Block Island | RI | 228,300 |
| Little Narragansett Bay | RI | 272,400 |
| Pt. Judith Harbor of Refuge | RI | 90,900 |
| Folly River | SC | 225,000 |
| Town Creek | SC | 320,000 |
| Hoskins Creek | VA | 582,000 |
| Rudee Inlet | VA | 1,200,000 |
| Columbia River Between Chinook & Sand Island | WA | 600,000 |
| Swinomish Channel | WA | 287,000 |
| | | 22,648,400 |

## FY 1988 CAPABILITIES

Senator JOHNSTON. Provide the record a table which shows the Corps' funding capability for new and on-going studies, PED and construction projects for FY 1988.

Mr. DAWSON. The information will be provided for the record.

[The information follows:]

STUDIES AVAILABLE FOR INITIATION

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| ARKANSAS | | | | |
| FDP | ARKANSAS RIVER - RUSSELLVILLE - MORRILTON, AR | 170 | 0 | 170 |
| FDP | BLACK RIVER, MO & AR | 415 | 0 | 415 |
| FDP | CENTRAL ARKANSAS STUDY, AR | 400 | 0 | 400 |
| FDP | LITTLE RED RIVER, AR | 300 | 0 | 300 |
| CALIFORNIA | | | | |
| N | HUMBOLDT HARBOR & BAY (DEEPENING), CA | 550 | 0 | 550 |
| FDP | IMPERIAL & SAN DIEGO COUNTIES STREAMS FLOWING INTO SALTON SEA, CA | 511 | 510 | 510 |
| FDP | NORTHERN CALIFORNIA STREAMS, COLUSA BASIN, CA | 200 | 0 | 200 |
| FDP | NORTHERN CALIFORNIA STREAMS, SACRAMENTO METROPOLITAN AREA, CA | 450 | 450 | 450 |
| SP | POINT MUGU TO SAN PEDRO BREAKWATER, CA | 426 | 0 | 310 |
| FDP | UPPER PUTAH CREEK, CA | 200 | 0 | 200 |
| COLORADO | | | | |
| FDP | DRY GULCH, CO | 50 | 0 | 50 |
| DELAWARE | | | | |
| FDP | DEL. BAY COASTLINE NJ AND DE | 755 | 0 | 755 |
| DIST OF COLUMBIA | | | | |
| N | METROPOLITAN WASHINGTON, DC, SEDIMENTATION | 255 | 0 | 255 |
| FLORIDA | | | | |
| FDP | BROWARD COUNTY, FL | 100 | 0 | 100 |
| FDP | CENTRAL & SOUTHERN FLORIDA HILLSBORO CANAL EAST OF AREAS 1&2 | 250 | 250 | 250 |
| N | CROSS FLORIDA BARGE CANAL, FL | 75 | 75 | 75 |
| GEORGIA | | | | |
| N | ALTAMAHA RIVER, GA | 215 | 0 | 215 |
| FDP | METRO MACON AREA, BIBB COUNTY, GA | 300 | 0 | 300 |
| FDP | SATILLA RIVER BASIN, GA | 200 | 0 | 200 |
| RCP | SAVANNAH RIVER BELOW AUGUSTA, GA | 50 | 50 | 50 |
| FDP | UPPER COOSA RIVER BASIN, GA | 350 | 0 | 350 |
| IDAHO | | | | |
| RDP | MUD LAKE ID | 180 | 180 | 180 |
| ILLINOIS | | | | |
| FDP | DES PLAINES RIVER, ILLINOIS | 1,500 | 550 | 550 |
| FDP | SANGAMON RIVER, SOUTH FORK, FLAT BRANCH, IL | 370 | 0 | 220 |
| INDIANA | | | | |
| FDP | PIGEON CREEK, IN | 400 | 0 | 400 |
| IOWA | | | | |
| FDP | CENTRAL RIVER BASINS OF IOWA, IA | 270 | 0 | 270 |
| FDP | CHARITON AND LITTLE CHARITON RIVERS AND TRIBUTORIES, IA & MO. | 200 | 0 | 200 |
| FDP | MISSOURI RIVER, YANKTON, SOUTH DAKOTA TO MOUTH | 590 | 0 | 590 |
| FDP | NORTHWEST RIVER BASINS OF IOWA, IA | 239 | 0 | 190 |
| FDP | SOUTH CENTRAL RIVER BASINS OF IOWA, IA | 180 | 0 | 190 |
| FDP | THURMAN TO HAMBURG, FREMONT COUNTY, IA | 100 | 0 | 100 |
| KENTUCKY | | | | |
| FDP | LICKING RIVER BASIN | 600 | 0 | 600 |
| FDP | METROPOLITAN REGION OF LOUISVILLE, KY | 630 | 0 | 630 |

STUDIES AVAILABLE FOR INITIATION

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1984 APPROVED BUDGET | FY 1985 CAPABILITY |
|---|---|---|---|---|
| LOUISIANA | | | | |
| FDP | MERMENTAU, VERMILION RIVER & BAYOU TIGRE, LA. | 245 | 0 | 245 |
| FDP | TANGIPAHOA, TICKFAW AND TCHEFUNCTE RIVERS, LA. | 525 | 0 | 525 |
| MAINE | | | | |
| SPE | POT'L CANADIAN TIDAL PWR DEV,BAY OF FUNDY,IMPACT ON U.S. | 1,100 | 0 | 1,100 |
| MARYLAND | | | | |
| N | BALTIMORE HARBOR & CHANNELS, MD, ANCHORAGES. | 165 | 0 | 165 |
| N | BALTIMORE HARBOR & CHANNELS DREDGED MATERIAL DISPOSAL MD & VA. | 150 | 0 | 150 |
| MASSACHUSETTS | | | | |
| N | MERRIMACK R., LAWRENCE TO HAVERHILL, MA. | 200 | 0 | 200 |
| N | MERRIMACK R., HAVERHILL TO MOUTH, MA. | 200 | 0 | 200 |
| MICHIGAN | | | | |
| N | INLAND ROUTE,MI. | 150 | 150 | 150 |
| FDP | SOUTHERN WAYNE COUNTY,MI | 125 | 0 | 125 |
| N | ST CLAIR RIVER, MI (ICE CONTROL). | 150 | 0 | 150 |
| FDP | ST. JOSEPH RIVER, MI & IN. | 320 | 320 | 320 |
| N | ST. JOSEPH HARBOR, MI, (COMMERCIAL). | 120 | 0 | 120 |
| MINNESOTA | | | | |
| FDP | CROOKSTON, MN. | 350 | 0 | 350 |
| MISSISSIPPI | | | | |
| FC | LOWER PEARL BASIN - FLOW DISTRIBUTION. | 200 | 0 | 200 |
| MISSOURI | | | | |
| FDP | CUIVRE RIVER, MO. | 400 | 400 | 400 |
| FDP | DARDENNE CREEK, MO (INTERIM - ST. LOUIS. METRO). | 500 | 0 | 500 |
| FDP | DRY FORK AND EAST FORKS LAKES, MISSOURI. | 200 | 0 | 200 |
| FDP | GRAND RIVER BASIN, MO & IA. | 310 | 310 | 310 |
| N | ST. LOUIS HARBOR FLEETING OF COMMERCIAL. VESSELS, MO. & IL. | 150 | 0 | 150 |
| MONTANA | | | | |
| MP | MILK RIVER BASIN, MT. | 120 | 0 | 120 |
| NEBRASKA | | | | |
| FDP | PLATTE RIVER FLOODWAY, NE. | 140 | 0 | 140 |
| NEVADA | | | | |
| FDP | ELKO, WASHOE CO, NV. | 300 | 0 | 300 |
| FDP | LOVELOCK, WASHOE CO, NV. | 300 | 0 | 300 |
| NEW HAMPSHIRE | | | | |
| FDP | ASHUELOT RIVER,NH. | 215 | 215 | 215 |
| FDP | MASCOMA RIVER,NH. | 215 | 215 | 215 |
| NEW JERSEY | | | | |
| FDP | MANALAPAN TOWNSHIP, NJ. | 150 | 0 | 150 |
| FDP | POPLAR BROOK, NJ. | 200 | 0 | 200 |
| NEW YORK | | | | |
| N | HUDSON RIVER, NY. | 500 | 0 | 500 |
| N | LAKE MONTAUK HARBOR, NY. | 200 | 0 | 200 |
| FDP | LONG BEACH, NY. | 400 | 0 | 400 |
| FDP | UPPER HUDSON RIVER, WARRENSBURG, NY. | 400 | 0 | 400 |

STUDIES AVAILABLE FOR INITIATION

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| NORTH DAKOTA | | | | |
| FDP | GRAND FORKS, ND | 300 | 0 | 300 |
| OHIO | | | | |
| SPE | BEAVER RIVER BASIN, TRUMBULL COUNTY WATER SUPPLY, OH | 150 | 0 | 150 |
| FDP | BELLEVUE, OH | 330 | 0 | 330 |
| FDP | BLACK RIVER, LORAIN COUNTY, OH | 220 | 0 | 220 |
| FDP | HURON RIVER, OH | 200 | 0 | 200 |
| FDP | METROPOLITAN REGION OF CINCINNATI, OH | 600 | 600 | 600 |
| FDP | MIAMI RVR, LITTLE MIAMI RVR, & MILL CREEK BSNS, VERSAILLES, OH | 300 | 0 | 300 |
| OKLAHOMA | | | | |
| FDP | NORTH CANADIAN RIVER ABOVE LAKE OVERHOLSER, OK | 210 | 210 | 210 |
| PENNSYLVANIA | | | | |
| FDP | DARBY CREEK-COBBS CREEK, PA | 250 | 0 | 250 |
| PUERTO RICO | | | | |
| N | GUAYANES, LAS MAREAS AND GUAYANILLA HARBORS, PR | 75 | 0 | 75 |
| FDP | GUAYANILLA RIVER BASIN, PR | 125 | 0 | 125 |
| SOUTH CAROLINA | | | | |
| FDP | JOHNS ISLAND, SC | 100 | 0 | 100 |
| FDP | LYNCHES RIVER, SC & NC | 75 | 0 | 75 |
| SOUTH DAKOTA | | | | |
| FDP | JAMES RIVER BASIN, SC | 150 | 0 | 150 |
| FDP | SOUTH DAKOTA LAKES, SD | 150 | 0 | 150 |
| FDP | VERMILLION RIVER AND TRIBUTARIES, SD | 200 | 0 | 200 |
| TEXAS | | | | |
| FC | BARDWELL LAKE, TX (REVIEW OF COMPLETED PROJECTS) | 50 | 0 | 50 |
| N | BRAZOS RIVER DIVERSION CHANNEL, TX | 380 | 0 | 380 |
| FDP | CENTRAL COLORADO RIVER BASIN, TX | 260 | 0 | 250 |
| FDP | DALLAS FLOODWAY, TX (REVIEW OF COMPLETED PROJECT) | 150 | 0 | 150 |
| SPE | EL PASO, TX AND VICINITY, RIO GRANDE AND TRIBUTARIES | 210 | 0 | 210 |
| SPE | MATAGORDA COUNTY, TX | 155 | 0 | 155 |
| N | PORT LAVACA TO RED BLUFF, TX | 100 | 0 | 100 |
| FDP | SAN BERNARD RIVER WATERSHED, TX | 250 | 0 | 250 |
| UTAH | | | | |
| FDP | BEAR RIVER, UTAH, IDAHO, WYOMING | 1,000 | 400 | 400 |
| VIRGINIA | | | | |
| N | AIWW, GREAT BRIDGE LOCK OPERATION, VA & NC | 1,000 | 0 | 250 |
| FDP | WAYNESBORO, VA | 175 | 0 | 175 |
| VIRGIN ISLANDS | | | | |
| FDP | TERRITORIES DEVELOPMENT STUDY | 250 | 0 | 250 |
| WASHINGTON | | | | |
| FC | WALLA WALLA RIVER, WA | 140 | 0 | 140 |
| WEST VIRGINIA | | | | |
| FDP | LITTLE KANAWHA RIVER, WV | 200 | 0 | 200 |
| FDP | MONONGAHELA RIVER BASIN, PA & WV | 500 | 0 | 500 |
| NATIONWIDE STUDIES | | | | |
| | CAPITAL INVESTMENT NEEDS STUDY | ND | 0 | 250 |
| | PROJECT EVALUATION AND SELECTION CRITERIA STUDY | 300 | 0 | 300 |
| | WATER RESOURCES NEEDS OF RIVER BASINS AND REGIONS STUDY | ND | 0 | 250 |

## CAPABILITIES FOR INITIATION OF PRECONSTRUCTION ENGINEERING & DESIGN

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| ALASKA | | | | |
| FC | HOMER SPIT STORM DAMAGE REDUCTION, AK... | 340 | 148 | 148 |
| N | KODIAK HARBOR (DOG BAY/HERMAN BAY), AK.. | 900 | 0 | 500 |
| ARIZONA | | | | |
| FC | NOGALES WASH, AZ........................ | 565 | 100 | 100 |
| FC | OLD CROSS-CUT CANAL, AZ................. | 630 | 100 | 100 |
| ARKANSAS | | | | |
| N | WHITE RIVER NAVIGATION-MOUTH TO ........ BATESVILLE, AR.......................... | 2,000 | 0 | 450 |
| CALIFORNIA | | | | |
| FC | CALIENTE CREEK, CA...................... | 3,000 | 100 | 100 |
| FC | COYOTE CREEK, CA........................ | 375 | 0 | 250 |
| FC | LOWER MISSION CREEK, CA.................. | 600 | 0 | 300 |
| COMM N. MARIANAS | | | | |
| N | NORTHERN MARIANA ISLAND HARBOR, CNMI.... | 500 | 350 | 350 |
| CONNECTICUT | | | | |
| FC | WESTCHESTER COUNTY STREAMS, BYRAM RIVER, CT & NY.............................. | 1,100 | 0 | 300 |
| HAWAII | | | | |
| FC | ALENAIO STREAM, HAWAII.................. | 500 | 300 | 300 |
| N | HILO HARBOR, HAWAII..................... | 400 | 0 | 200 |
| IDAHO | | | | |
| FC | LITTLEWOOD RIVER VICINITY GOODING ...... SHOSHONE ID............................ | 470 | 0 | 175 |
| INDIANA | | | | |
| FDP | FORT WAYNE, IN.......................... | 1,050 | 250 | 250 |
| IOWA | | | | |
| FDP | THURMAN TO HAMBURG, IA PUMPING .......... FACILITIES.............................. | 100 | 0 | 100 |
| FDP | WEST DES MOINES AND DES MOINES, IA....... | 1,100 | 0 | 250 |
| KANSAS | | | | |
| FDP | ARKANSAS CITY, KS....................... | 880 | 0 | 450 |
| FDP | UPPER LITTLE ARKANSAS RIVER WATERSHED, . KANSAS.................................. | 1,090 | 0 | 400 |
| KENTUCKY | | | | |
| FC | HAZARD, KY.............................. | 600 | 0 | 150 |
| LOUISIANA | | | | |
| FC | WESTWEGO TO HARVEY CANAL, LA (HURRICANE. PROTECTION).............................. | 1,900 | 0 | 1,000 |
| MASSACHUSETTS | | | | |
| FC | BROCKTON, MA............................ | 200 | 0 | 200 |
| N | MERRIMACK R., LOWELL TO LAWRENCE, MA.... | 80 | 0 | 80 |
| MICHIGAN | | | | |
| N | GRAND HAVEN HARBOR, MI................... | 775 | 0 | 310 |
| N | GREAT LAKES CONNECTING CHANNELS AND .... HARBORS REPLACEMENT LOCK, MI............ | 8,300 | 0 | 2,000 |
| N | GREAT LAKES CONNECTING CHANNELS & ...... HARBORS................................. | 320 | 0 | 100 |
| MINNESOTA | | | | |
| FDP | MISSISSIPPI RIVER AT ST. PAUL, MN....... | 1,100 | 0 | 350 |

## CAPABILITIES FOR INITIATION OF PRECONSTRUCTION ENGINEERING & DESIGN

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| NEVADA | | | | |
| FC | TRUCKEE MEADOWS, NV. | 4,300 | 1,400 | 1,400 |
| NEW JERSEY | | | | |
| BE | CAPE MAY POINT, NJ. | 387 | 0 | 100 |
| N | DEL RIV IN VIC OF CAMDEN(BECKETT ST TERMINAL),NJ. | 250 | 170 | 170 |
| FC | LOWER SADDLE RIVER, NJ. | 3,900 | 500 | 500 |
| FC | MOLLY ANN'S BROOK,NJ. | 1,310 | 0 | 250 |
| N | NY HARBOR & ADJACENT CHANNELS, NY & NJ (CLAREMONT TERMINAL). | 1,350 | 0 | 200 |
| N | NY HARBOR & ADJACENT CHANNELS, NY & NJ (PORT JERSEY). | 1,350 | 0 | 100 |
| FC | RAHWAY RI BASIN,UPPER ROBINSONS BRANCH, CLARK & SCOTCH PLAINS,NJ. | 770 | 0 | 150 |
| FC | RAMAPO RIVER AT OAKLAND, NJ. | 1,300 | 250 | 250 |
| NEW MEXICO | | | | |
| FC | ABIQUIU DAM, NM, EMERGENCY GATES. | 100 | 0 | 100 |
| NEW YORK | | | | |
| N | GOWANUS CREEK CHANNEL,NY. | 500 | 150 | 150 |
| FDP | TONAWANDA CREEK, NY (BATAVIA RES.). | 850 | 0 | 300 |
| OHIO | | | | |
| FC | WHEELING CREEK, WATERSHED, OH. | 250 | 0 | 125 |
| FC | WHEELING CREEK, INTERIM EMERGENCY FLOOD. CONTROL MEASURES, OH. | 600 | 0 | 200 |
| OKLAHOMA | | | | |
| FDP | FRY CREEK, LOCAL PROTECTION, BIXBY, OKLAHOMA. | 590 | 0 | 330 |
| PENNSYLVANIA | | | | |
| FC | SAW MILL RUN AT PITTSBURGH, PA. | 600 | 0 | 200 |
| PUERTO RICO | | | | |
| N | SAN JUAN HARBOR, PR. | 2,300 | 520 | 520 |
| RHODE ISLAND | | | | |
| FC | BIG RIVER RESERVOIR, RI. | 1,700 | 0 | 300 |
| TEXAS | | | | |
| FDP | CYPRESS CREEK,VIC OF HOUSTON,TX. | 4,590 | 0 | 500 |
| FDP | FIVE MILE CREEK, DALLAS, TX. | 730 | 0 | 100 |
| FDP | GALVESTON ISLAND BEACH, TX (WEST BEACH). | 270 | 0 | 100 |
| FDP | LOWER RIO GRANDE BASIN, TX. | 1,830 | 0 | 400 |
| WASHINGTON | | | | |
| FC | CENTRALIA, WA. | 1,700 | 400 | 400 |
| WEST VIRGINIA | | | | |
| FC | ISLAND CREEK BASIN LOGAN, WEST VIRGINIA. | 2,300 | 0 | 500 |
| FC | ROWLESBURG LAKE, W. VA. | 7,858 | 0 | 500 |
| WISCONSIN | | | | |
| FDP | WISCONSIN RIVER AT PORTAGE, WI. | 825 | 0 | 300 |

PROJECTS AVAILABLE FOR INITIATION OF CONSTRUCTION

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| CALIFORNIA | | | | |
| FC | CACHE CREEK, CA. | 19,700 | 0 | 250 |
| N | OAKLAND INNER HARBOR, CA | 19,200 | 3,800 | 3,800 |
| N | RICHMOND HARBOR, CA. | 20,100 | 900 | 900 |
| FC | WHITEWATER RIVER FLOODWARNING SYSTEM,CA. | 225 | 0 | 225 |
| COLORADO | | | | |
| FC | WESTERLY CREEK, CO. | 8,800 | 700 | 700 |
| FLORIDA | | | | |
| N | MANATEE HARBOR, FL. | 9,450 | 2,400 | 2,400 |
| GEORGIA | | | | |
| FDP | OATES CREEK, RICHMOND COUNTY, GA. | 7,941 | 400 | 400 |
| ILLINOIS | | | | |
| FC | NORTH BRANCH CHICAGO RIVER, IL. | 16,700 | 2,000 | 2,000 |
| MINNESOTA | | | | |
| FC | CHASKA, MN. | 21,400 | 0 | 1,600 |
| NEW MEXICO | | | | |
| FC | ALAMOGORDO, NM. | 20,400 | 2,000 | 2,000 |
| FC | PUERCO RIVER AND TRIBUTARIES, GALLUP, NM. | 5,500 | 760 | 760 |
| FC | RIO GRANDE FLOODWAY, TRUTH OR CONSEQUENCES UNIT, NM. | 12,000 | 700 | 700 |
| OHIO | | | | |
| FC | RENO BEACH-HOWARD FARMS, OH. | 5,560 | 1,180 | 1,180 |
| OKLAHOMA | | | | |
| FC | MINGO CREEK, TULSA, OK. | 80,900 | 2,400 | 2,400 |
| SOUTH CAROLINA | | | | |
| N | CHARLESTON HARBOR (DEEPENING), S.C. | 64,875 | 8,000 | 8,130 |
| WISCONSIN | | | | |
| FC | STATE ROAD AND EBNER COULEES, WI. | 26,300 | 3,200 | 3,200 |

## CAPABILITIES FOR INITIATION OF PRECONSTRUCTION ENGINEERING & DESIGN
## MISSISSIPPI RIVER & TRIBUTARIES

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1989 CAPABILITY |
|---|---|---|---|---|
| ARKANSAS | | | | |
| FC | HELENA, AR & VIC. | 1,400 | 0 | 500 |
| FC | WEST MEMPHIS, AR | 675 | 0 | 350 |

## PROJECTS AVAILABLE FOR INITIATION OF CONSTRUCTION
## MISSISSIPPI RIVER & TRIBUTARIES

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1989 CAPABILITY |
|---|---|---|---|---|
| LOUISIANA | | | | |
| FC | MISSISSIPPI DELTA REGION, SALINITY CONTROL STRUCTURES, LA | 41,000 | 4,500 | 4,500 |

## CAPABILITIES FOR STUDIES UNDERWAY

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1989 CAPABILITY |
|---|---|---|---|---|
| ALABAMA | | | | |
| N | APALACHICOLA RIVER "308" REPORT, GA, AL. & FL. | 2,281 | 320 | 320 |
| FDP | TOMBIGBEE RIVER AND TRIBUTARIES, AL & MS. | 3,500 | 700 | 700 |
| FDP | VALLEY CREEK WARRIOR RIVER & TRIBUTARIES, AL | 650 | 200 | 200 |
| ALASKA | | | | |
| FDP | RIVERS AND HARBORS, AK. | 9,752 | 1,064 | 1,064 |
| ARIZONA | | | | |
| FDP | ALAMO LAKE, AZ. | 875 | 100 | 100 |
| FDP | NAVAJO INDIAN RESERVATION, AZ, INCLUDING GANADO DAM, & UT. | 1,500 | 100 | 100 |
| ARKANSAS | | | | |
| FDP | ARKANSAS RIVER BASIN, AR AND OK. | 1,945 | 700 | 700 |
| FDP | OUACHITA RIVER BASIN, AR & LA. | 5,555 | 340 | 340 |
| COM | WHITE RIVER BASIN AUTHORIZATION REPORT, AR & MO. | 1,430 | 400 | 400 |
| CALIFORNIA | | | | |
| FDP | CALLEGUAS CREEK, CA. | 2,290 | 200 | 200 |
| SPE | COAST OF CALIFORNIA, STORM AND TIDAL WAVES, CA. | 7,740 | 1,100 | 1,100 |
| N | LOS ANGELES-LONG BEACH HARBORS, CA. | 7,800 | 600 | 600 |
| FDP | LOS ANGELES COUNTY DRAINAGE AREA - REVIEW, CA. | 5,950 | 650 | 650 |
| FDP | MARIN COUNTY SHORELINE-SAN RAFAEL CANAL, CA. | 650 | 100 | 190 |
| N | MORRO BAY HARBOR, CA. | 854 | 100 | 100 |
| FDP | NORTHERN CALIFORNIA STREAMS, DRY CREEK, CA. | 744 | 75 | ~~75~~ |
| FDP | NORTHERN CALIFORNIA STREAMS, BLUE RIDGE/CACHE CREEK, CA. | 500 | 100 | 100 |
| FDP | NORTHERN CALIFORNIA STREAMS, AMERICAN RIVER WATERSHED, CA. | 1,250 | 200 | 200 |
| N | REDONDO BEACH HARBOR (KING HARBOR), CA. | 730 | 36 | 36 |
| FDP | SACRAMENTO - SAN JOAQUIN DELTA, CA. | 2,900 | 210 | 250 |
| FDP | SAN FRANCISCO BAY SHORELINE, CA. | 4,280 | 600 | 600 |
| FDP | SAN JOAQUIN RIVER BASIN, KAWEAH RIVER, CA. | 715 | 260 | 260 |
| FDP | SAN JOAQUIN RIVER BASIN, TULE RIVER, CA. | 650 | 260 | 250 |
| FDP | SANTA ANA RIVER & ORANGE COUNTY, CA. | 9,500 | 650 | 650 |
| N | SANTA BARBARA HARBOR, CA (RESTUDY) | 550 | 100 | 100 |
| N | VENTURA MARINA (REVIEW), CA. | 685 | 210 | 210 |

## CAPABILITIES FOR STUDIES UNDERWAY

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| COLORADO | | | | |
| FDP | FOUNTAIN CREEK AND TRIBS - NORTH OF PUEBLO, CO | 730 | 140 | 140 |
| FDP | PLATTE RIVER BASIN, CO,NE,WY | 450 | 80 | 80 |
| CONNECTICUT | | | | |
| COM | LONG ISLAND SOUND, CT (WEST CENTRAL COASTAL FLOODING) | 625 | 100 | 100 |
| FLORIDA | | | | |
| SP | BREVARD COUNTY, FL | 267 | 157 | 157 |
| N | CANAVERAL HARBOR, FL | 162 | 75 | 75 |
| FDP | COAST OF FLORIDA EROSION & STORM EFFECTS STUDY | 7,780 | 1,000 | 1,000 |
| SP | FLAGLER COUNTY, FL | 295 | 100 | 100 |
| N | PORT EVERGLADES HARBOR, FL | 165 | 72 | 72 |
| FDP | ST. MARY'S RIVER BASIN, FL & GA | 1,122 | 136 | 136 |
| FDP | SUWANNEE RIVER, FL | 1,648 | 300 | 300 |
| GEORGIA | | | | |
| N | BRUNSWICK HARBOR, GA | 1,389 | 439 | 439 |
| FDP | SAVANNAH RIVER BASIN, GA, SC & NC | 1,030 | 300 | 300 |
| HAWAII | | | | |
| FDP | HARBORS & RIVERS IN HAWAII, HI | 3,485 | 60 | 60 |
| N | HILO BAY METRO AREA, HI | 1,580 | 77 | 77 |
| FDP | KEOPU-HIENALOLI STREAM, KONA, HI | 315 | 102 | 102 |
| IDAHO | | | | |
| FDP | COLUMBIA RIVER & TRIBUTARIES, ID, MT, OR, WA & WY | 22,240 | 1,327 | 1,327 |
| FDP | PALOUSE RIVER & TRIBUTARIES, ID & WA | 243 | 100 | 100 |
| FDP | UPPER SNAKE RIVER & TRIBUTARIES, ID & WY | 8,601 | 971 | 971 |
| ILLINOIS | | | | |
| FDP | ALEXANDER AND PULASKI COUNTIES, IL | 803 | 250 | 250 |
| FDP | CHICAGO-SOUTH END OF LAKE MICHIGAN, IL & IN | 4,937 | 400 | 400 |
| FDP | ILLINOIS RIVER BETWEEN HENRY, NAPLES, IL | 1,270 | 300 | 300 |
| BE | ILLINOIS SHORE OF LAKE MICHIGAN, IL | 1,608 | 143 | 143 |
| FDP | ST. LOUIS METRO, MO & IL | 11,575 | 434 | 434 |
| INDIANA | | | | |
| N | WABASH RIVER BASIN COMPREHENSIVE IN & IL (NAV INTERIM) | 2,900 | 825 | 825 |
| KANSAS | | | | |
| FDP | ARK RIV AND TRIBS GREAT BEND KS TO TULSA, OK | 7,290 | 500 | 500 |
| FDP | ARKANSAS RIVER FROM GREAT BEND KS TO JOHN MARTIN DAM, CO | 2,720 | 0 | 170 |
| FDP | BLUE RIVER BASIN, KANSAS AND MISSOURI | 595 | 135 | 135 |
| FDP | GRAND NEOSHO RIVER, KS & OK, ABOVE JOHN. REDMOND DAM | 1,780 | 300 | 300 |
| FDP | TURKEY CREEK BASIN, KANSAS AND MISSOURI. | 670 | 200 | 200 |
| KENTUCKY | | | | |
| N | CUMBERLAND-TENNESSEE RIVERS, KY, AL, GA, MS, NC, TN, & VA | 5,358 | 1,470 | 1,470 |
| FDP | KENTUCKY RIVER AND TRIBUTARIES KY | 3,587 | 420 | 420 |
| FDP | KENTUCTY RIVER AND TRIBS, KY (FDP) (STATION CAMP CREEK INTERIM) | 800 | 50 | 50 |
| FDP | OHIO RIVER MAIN STEM, PA,IL,IN,OH, & WV. | 15,370 | 2,031 | 2,331 |
| LOUISIANA | | | | |
| FDP | AMITE RIVER AND TRIBUTARIES, LA | 2,149 | 400 | 400 |
| N | BAYOU LAFOURCHE & LAFOURCHE-JUMP WW, LA. | 179 | 52 | 52 |

CAPABILITIES FOR STUDIES UNDERWAY

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| N | GULF INTRACOASTAL WATERWAY, LA & TX SECTION | 4,270 | 425 | 425 |
| FDP | LAKE PONTCHARTRAIN-WEST SHORE, LA | 740 | 175 | 175 |
| FDP | LOUISIANA COASTAL AREA, HURRICANE PROTECTION, LA | 1,200 | 275 | 275 |
| FDP | LOUISIANA COASTAL AREA, SHORE & BARRIER ISLAND EROSION, LA | 1,716 | 165 | 165 |
| FDP | LOUISIANA COASTAL AREA - LAND LOSS AND MARSH CREATION, LA | 1,546 | 276 | 276 |
| FDP | MERMENTAU, VERMILION, & CALCASIEU RVS & BAYOU TECHE, LA | 5,058 | 510 | 510 |
| NAV | MISS. R. - GULF OUTLET BANK EROSION - ST. BERNARD PAR, LA | 472 | 200 | 200 |
| FDP | PEARL RIVER BASIN, MS & LA | 8,720 | 230 | 230 |
| FDP | UPPER BAYOU TECHE, LA | 386 | 125 | 125 |
| FDP | WEST BANK MISS. R. VIC. NEW ORLEANS, LA. | 1,725 | 500 | 500 |
| MARYLAND | | | | |
| FDP | MONONGAHELA-YOUGHIOGHENY RIVER BASIN PA, MD & WVA | 8,733 | 850 | 850 |
| MASSACHUSETTS | | | | |
| COM | CONN R.B. AUTH REPORTS, CT,MA,NH & VT | 4,799 | 274 | 274 |
| FDP | HOOSIC RIVER, MA, VT & NY | 479 | 0 | 192 |
| COM | SOUTHEASTERN NEW ENGLAND, MA, RI & CT (AUTHORIZATION REPORTS) | 3,750 | 540 | 540 |
| MICHIGAN | | | | |
| FDP | SAGINAW RIVER, MI | 3,800 | 1,200 | 1,200 |
| MINNESOTA | | | | |
| FDP | MINNESOTA RIVER VALLEY, MN | 6,750 | 250 | 250 |
| FDP | WILD RICE - MARSH RIVERS, MN | 900 | 250 | 250 |
| MISSISSIPPI | | | | |
| FDP | MISSISSIPPI GULF COASTAL AREAS, MS | 685 | 121 | 121 |
| MISSOURI | | | | |
| FDP | CREVE COEUR CREEK, MO (INTERIM - ST. LOUIS METRO) | 1,088 | 270 | 270 |
| FDP | MERAMEC RIVER BASIN, MO | 1,021 | 175 | 175 |
| FDP | OSAGE RIVER BASIN, MO, ABOVE HARRY S TRUMAN DAM | 1,370 | 80 | 80 |
| FDP | ST. JOSEPH, MO AND VICINITY | 510 | 150 | 150 |
| NEVADA | | | | |
| FDP | LAS VEGAS WASH & TRIBUTARIES, NV | 1,670 | 253 | 253 |
| NEW JERSEY | | | | |
| N | ARTHUR KILL EXTENSION, HOWLAND HOOK TO CARTERET, NJ & NY | 375 | 200 | 200 |
| N | DELAWARE RIVER COMPREHENSIVE NAVIGATION STUDY, NJ, PA, & DE | 6,334 | 780 | 780 |
| FDP | ELIZABETH RIVER AND TRIBUTARIES, NJ | 645 | 100 | 100 |
| FDP | HACKENSACK RIVER BASIN, NJ&NY | 1,606 | 300 | 300 |
| N | NJIWW, SHREWSBURY RIVER, NJ TO DELAWARE BAY | 670 | 50 | 50 |
| FDP | RARITAN RIVER BASIN, NJ | 3,414 | 0 | 350 |
| NEW MEXICO | | | | |
| FDP | CARLSBAD, PECOS RIVER & TRIBS, NM | 500 | 150 | 150 |
| FDP | RIO GRANDE AND TRIBUTARIES, NM & CO | 7,270 | 525 | 525 |
| FDP | ROSWELL PECOS RIVER & TRIBS, NM | 825 | 350 | 350 |
| NEW YORK | | | | |
| FDP | BUFFALO METROPOLITAN AREA,NY (BUFFALO RIVER- TONAWANDA CREEK) | 2,820 | 300 | 300 |
| FDP | CATTARAUGUS CREEK, NY | 520 | 114 | 114 |
| COM | GENESEE RIVER BASIN AUTH REPORT, NY | 890 | 164 | 164 |
| FDP | MOOSE & BLACK RIVERS, NY | 900 | 260 | 250 |

CAPABILITIES FOR STUDIES UNDERWAY

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| NORTH CAROLINA | | | | |
| FDP | EASTERN NORTH CAROLINA ABOVE CAPE LOOKOUT, NC | 1,602 | 390 | 390 |
| N | MOREHEAD CITY HARBOR, NC | 523 | 125 | 125 |
| FDP | NEUSE RIVER, NC | 2,993 | 735 | 735 |
| SP | WEST ONSLOW BEACH AND NEW RIVER INLET, NC | 812 | 0 | 110 |
| OHIO | | | | |
| FDP | CENTRAL OHIO SURVEY, OH | 3,885 | 185 | 185 |
| FDP | CENTRAL OHIO SURVEY, GRANDVIEW HEIGHTS INTERIM, OHIO | 416 | 100 | 100 |
| FDP | SANDUSKY RIVER, OH | 1,020 | 325 | 325 |
| FDP | VERMILION RIVER, OH | 504 | 142 | 142 |
| OKLAHOMA | | | | |
| COM | ARK RIV & TRIBS, SOUTH CENTRAL & SOUTHEAST AREAS OF OK (COMP) | 2,000 | 419 | 419 |
| FDP | CANADIAN RIVER AND TRIBS, OK, TX & NM | 2,760 | 0 | 180 |
| FDP | LUKFATA LAKE, OK (HYDROPOWER STUDY) | 830 | 0 | 160 |
| COM | RED RIV BASIN, AR, TX, LA & OK (COMP) | 3,100 | 660 | 650 |
| OREGON | | | | |
| N | COOS BAY, OR | 488 | 100 | 100 |
| FDP | UMPQUA RIVER & TRIBUTARIES, OR | 2,315 | 374 | 374 |
| COM | WILLAMETTE RIVER BASIN, OR | 3,872 | 745 | 843 |
| PENNSYLVANIA | | | | |
| FDP | KISKIMINETAS RIVER BASIN, PA | 1,507 | 0 | 200 |
| FDP | LACKAWANNA RIVER, PA | 800 | 150 | 150 |
| PUERTO RICO | | | | |
| FDP | ARECIBO RIVER, PR | 377 | 100 | 100 |
| FDP | GUANAJIBO RIVER, PR | 894 | 250 | 250 |
| SOUTH CAROLINA | | | | |
| FDP | SUGAR CREEK BASIN, NC & SC | 1,411 | 0 | 120 |
| SOUTH DAKOTA | | | | |
| FDP | WATERTOWN AND VICINITY, SD | 330 | 175 | 175 |
| TENNESSEE | | | | |
| FDP | METROPOLITAN REGION OF NASHVILLE, TN | 4,722 | 235 | 235 |
| TEXAS | | | | |
| FDP | BRAZOS RIVER AND TRIBUTARIES, TX | 8,070 | 642 | 642 |
| FDP | CAMERON COUNTY, TX | 1,736 | 610 | 610 |
| FDP | HILLEBRANDT BAYOU & TRIBUTARIES, TX | 673 | 170 | 170 |
| FDP | LITTLE FOSSIL CREEK, TX | 513 | 75 | 75 |
| FDP | SAN JACINTO RIVER & TRIBUTARIES, TX | 3,330 | 0 | 56 |
| UTAH | | | | |
| FDP | JORDAN RIVER BASIN, UT | 2,750 | 230 | 230 |
| VIRGINIA | | | | |
| FDP | COVINGTON, VA | 475 | 124 | 124 |
| WASHINGTON | | | | |
| N | BELLINGHAM HARBOR, WA | 365 | 110 | 110 |
| N | OLYMPIA HARBOR, WA | 365 | 110 | 110 |
| COM | PUGET SOUND AND ADJACENT WATERS, WA | 8,427 | 395 | 395 |
| N | SNOHOMISH RIVER & TRIBS, WA | 964 | 0 | 150 |
| WEST VIRGINIA | | | | |
| N | KANAWHA RIVER, WV | 5,395 | 400 | 400 |
| COM | KANAWHA BASIN COMPREHENSIVE (AUTHORIZATION REPORTS), WV, VA & NC | 5,919 | 935 | 935 |

## CAPABILITIES FOR STUDIES UNDERWAY

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| FDP | MOOREFIELD,WV | 375 | 130 | 130 |
| FDP | PETERSBURG,WV | 523 | 150 | 150 |
| FDP | SOUTH BRANCH POTOMAC RIVER,WV & VA | 600 | 240 | 240 |
| FDP | UPPER POTOMAC RIVER BASIN,WV,VA,MD & PA. (PARENT) | 180 | 0 | 80 |

## CAPABILITIES FOR CONTINUING PRECONSTRUCTION ENGINEERING & DESIGN

| | | | | |
|---|---|---|---|---|
| ALASKA | | | | |
| N | ST. PAUL ISLAND HARBOR, AK | 850 | 300 | 300 |
| ARIZONA | | | | |
| FC | HOLBROOK, AZ | 1,330 | 400 | 400 |
| FC | RILLITO RIVER, AZ | 800 | 300 | 300 |
| ARKANSAS | | | | |
| FDP | NORTH LITTLE ROCK - AR (DARK HOLLOW) | 700 | 300 | 300 |
| CALIFORNIA | | | | |
| FC | CACHE CREEK BASIN, CA | 3,000 | 280 | 280 |
| FC | GUADALUPE RIVER, CA | 2,000 | 625 | 625 |
| N | NOYO RIVER AND HARBOR (BREAKWATER), CA | 5,800 | 450 | 450 |
| N | NOYO RIVER AND HARBOR (CHANNEL EXTENSION), CA | 1,700 | 130 | 130 |
| FC | SANTA ANA RIVER MAINSTEM, CA | 26,100 | 5,100 | 5,100 |
| CONNECTICUT | | | | |
| N | NEW HAVEN HARBOR, CT | 700 | 100 | 100 |
| DIST OF COLUMBIA | | | | |
| FC | WASHINGTON, DC & VICINITY | 2,300 | 900 | 900 |
| FLORIDA | | | | |
| N | FT.PIERCE HARBOR, FL | 296 | 100 | 100 |
| ILLINOIS | | | | |
| N | LOCKS AND DAMS 52 & 53 KY (REPLACEMENT . STRUCT) | 7,500 | 1,500 | 2,500 |
| FDP | LOVES PARK,IL | 1,400 | 350 | 350 |
| FDP | O'HARE RESERVOIR, IL | 800 | 400 | 400 |
| INDIANA | | | | |
| FDP | LITTLE CALUMET RIVER, IN | 1,660 | 250 | 250 |
| IOWA | | | | |
| FDP | MUSCATINE ISLAND LEVEE AND DRAINAGE DISTRICT,IA | 400 | 150 | 150 |
| FDP | PERRY CREEK, IA | 970 | 174 | 174 |
| KANSAS | | | | |
| FC | DOUGLASS LAKE, KS | 3,000 | 500 | 500 |
| KENTUCKY | | | | |
| FC | FRANKFORT, KENTUCKY; SOUTH FRANKFORT SEC | 682 | 0 | 400 |
| MARYLAND | | | | |
| FC | ATLANTIC COAST OF MARYLAND & ASSATEAGUE. ISLAND, VIRGINIA | 2,600 | 500 | 500 |
| MASSACHUSETTS | | | | |
| FC | MASSACHUSETTS COASTAL, ROUGHANS POINT, . REVERE, MA | 1,200 | 117 | 117 |

CAPABILITIES FOR CONTINUING PRECONSTRUCTION ENGINEERING & DESIGN

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| MICHIGAN | | | | |
| N | MONROE HARBOR, MI | 2,025 | 0 | 800 |
| MINNESOTA | | | | |
| N | DULUTH SUPERIOR HARBOR, MN & WI | 725 | 245 | 245 |
| FDP | ROOT RIVER AT HOUSTON, MN | 1,300 | 247 | 247 |
| MISSISSIPPI | | | | |
| N | GULFPORT HARBOR, MS | 2,500 | 800 | 800 |
| N | PASCAGOULA HARBOR DEEPENING, MS | 2,160 | 900 | 900 |
| FC | PEARL RIVER BASIN SHOCCOE DAM, MS | 3,300 | 900 | 900 |
| MISSOURI | | | | |
| FC | BRUSH CREEK, KANSAS CITY, MO | 1,400 | 350 | 350 |
| FC | CAPE GIRARDEAU-JACKSON AREA, MO | 2,500 | 600 | 600 |
| FC | MALINE CREEK, MO | 4,300 | 885 | 885 |
| NEW JERSEY | | | | |
| FC | RAMAPO AND MAHWAH RIVERS, NJ & NY | 700 | 230 | 230 |
| FC | RARITAN RIVER BASIN, GREEN BROOK SUB-BASIN, NJ | 5,300 | 1,400 | 1,400 |
| NEW MEXICO | | | | |
| FDP | MID RIO GRANDE - BERNALILLO TO BELEN, NM | 2,560 | 400 | 400 |
| FC | RIO GRANDE FLOODWAY SAN ACACIA TO BOSQUE DEL APACHE UNIT, NM | 1,360 | 390 | 390 |
| NEW YORK | | | | |
| N | ARTHUR KILL CHANNEL, HOWLAND HOOK MARINE. TERMINAL, NY | 1,100 | 323 | 323 |
| FC | SAW MILL RIVER AT ELMSFORD & GREENBURGH, NY | 950 | 119 | 119 |
| N | SHINNECOCK INLET, NY | 1,300 | 54 | 54 |
| FC | WESTCHESTER CTY STREAMS, MAMARONECK & SHELDRAKE RIVERS, NY | 3,300 | 400 | 400 |
| NORTH CAROLINA | | | | |
| N | WILMINGTON HARBOR- NE CAPE FEAR RIVER, NC | 670 | 195 | 195 |
| NORTH DAKOTA | | | | |
| FC | SHEYENNE RIVER, ND | 4,550 | 439 | 739 |
| OHIO | | | | |
| FC | FAIRFIELD, OH | 1,209 | 100 | 250 |
| FC | HOLES CREEK AT WEST CARROLTON AND MORAINE, OH | 770 | 175 | 175 |
| FC | LOGAN, OH | 1,300 | 100 | 200 |
| N | LORAIN HARBOR, OH | 430 | 124 | 124 |
| FC | NELSONVILLE, OH | 1,085 | 200 | 200 |
| FC | NORTH CHILLICOTHE, OH | 1,150 | 300 | 300 |
| OREGON | | | | |
| FC | PENINSULA DRAINAGE DISTRICT NO. 2, OR | 480 | 0 | 320 |
| PENNSYLVANIA | | | | |
| FC | LOCK HAVEN, PA | 3,675 | 1,049 | 1,049 |
| FC | PROMPTON LAKE (MODIFICATION), PA | 3,900 | 1,000 | 1,000 |
| N | SCHUYLKILL RIVER (MOUTH TO PENROSE AVE), PA | 310 | 150 | 150 |
| FC | SUSQUEHANNA BASIN AT HARRISBURG, PENNSYLVANIA | 4,500 | 965 | 965 |
| FC | WYOMING VALLEY, PA (LEVEE RAISING) | 7,700 | 1,800 | 1,800 |
| PUERTO RICO | | | | |
| FDP | RIO PUERTO NUEVO, PR | 6,000 | 1,500 | 1,500 |

## CAPABILITIES FOR CONTINUING PRECONSTRUCTION ENGINEERING & DESIGN

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| TEXAS | | | | |
| N | BRAZOS ISLAND HARBOR (42 FOOT PROJECT), TX | 1,200 | 330 | 330 |
| MP | CHANNEL TO LIBERTY, TRINITY RIVER PROJECT, TX | 3,600 | 0 | 300 |
| FDP | SIMS BAYOU, TX (HOUSTON) | 2,200 | 850 | 850 |
| N | TEXAS CITY CHANNEL, TX (50-FOOT PROJECT) | 1,800 | 510 | 510 |
| FDP | UPPER WHITE OAK BAYOU & TRIBUTARIES-VICINITY OF HOUSTON,TX | 3,900 | 1,050 | 1,050 |
| VIRGINIA | | | | |
| FC | ROANOKE RIVER UPPER BASIN, VIRGINIA, HEADWATERS AREA | 1,410 | 300 | 395 |
| BE | VIRGINIA BEACH,VA | 2,860 | 500 | 500 |
| WASHINGTON | | | | |
| N | GRAYS HARBOR, CHEHALIS AND HOQUIAM RIVERS,WA | 5,860 | 700 | 1,200 |
| FC | ZINTEL CANYON DAM WA | 882 | 0 | 490 |

## CAPABILITIES FOR CONSTRUCTION PROJECTS UNDERWAY

| | | | | |
|---|---|---|---|---|
| ALABAMA | | | | |
| N | BLACK WARRIOR AND TOMBIGBEE RVRS, VICINITY OF JACKSON, AL | 1,985 | 1,350 | 1,350 |
| N | MOBILE HARBOR DEEPENING - AL | 284,040 | 16,200 | 16,200 |
| FC | THREEMILE CREEK - MOBILE, AL | 9,800 | 5,000 | 5,000 |
| FC | TOMBIGBEE RIVER & TRIBUTARIES, MS & AL | 49,000 | 3,500 | 3,500 |
| FC | VILLAGE CREEK, JEFFERSON COUNTY, AL | 26,135 | 8,000 | 8,000 |
| N | WILLIAM BACON OLIVER LOCK & DAM REPLACEMENT, AL | 122,000 | 22,000 | 22,000 |
| ALASKA | | | | |
| FC | CHENA RIVER LAKES, AK | 210,000 | 4,000 | 4,000 |
| MP | SNETTISHAM, AK | 132,000 | 11,000 | 11,000 |
| ARIZONA | | | | |
| FC | PHOENIX, AZ & VICINITY INCLUDING NEW RIVER (STAGE 2 & REMAIN WK) | 226,000 | 38,000 | 38,000 |
| FC | SANTA ROSA WASH, TAT MOMOLIKOT DAM, AZ | 17,219 | 7,000 | 7,000 |
| ARKANSAS | | | | |
| FC | FOURCHE BAYOU BASIN, LITTLE ROCK, AR | 11,050 | 2,300 | 2,300 |
| N | MCCLELLAN-KERR ARK RVR NAVIGATION SYSTEM LOCKS & DAM, AR & OK | 547,500 | 4,350 | 4,350 |
| N | OUACHITA & BLACK RIVERS, AR & LA | 269,000 | 4,300 | 4,300 |
| CALIFORNIA | | | | |
| FC | CORTE MADERA CREEK, CA | 12,700 | 1,700 | 1,700 |
| FC | DRY CREEK (WARM SPRINGS) LAKE AND CHANNEL, CA | 346,000 | 8,200 | 8,200 |
| FC | FAIRFIELD VICINITY STREAMS, CA | 10,500 | 3,900 | 3,900 |
| FC | LOWER SAN JOAQUIN RIVER, CA | 17,976 | 1,002 | 1,002 |
| FC | MERCED COUNTY STREAMS,CA | 62,000 | 2,400 | 2,400 |
| MP | NEW MELONES LAKE, CA | 385,000 | 4,100 | 4,100 |
| N | OAKLAND OUTER HARBOR, CA | 14,900 | 6,500 | 6,500 |
| FC | PAJARO RIVER, CA | 2,945 | 1,865 | 1,865 |
| FC | REDBANK & FANCHER CREEKS, CA | 49,200 | 1,900 | 1,900 |
| FC | SACRAMENTO RIVER & MAJOR AND MINOR TRIBUTARIES, CA | 11,900 | 98 | 98 |

## CAPABILITIES FOR CONSTRUCTION PROJECTS UNDERWAY

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| FC | SACRAMENTO RIVER FLOOD CONTROL PROJECT, CA | 74,600 | 2,800 | 4,885 |
| N | SACRAMENTO RIVER DEEP WATER SHIP CHANNEL, CA | 39,500 | 11,000 | 11,000 |
| FC | SACRAMENTO RIVER BANK PROTECTION PROJECT, CA | 92,300 | 9,500 | 9,500 |
| N | SAN FRANCISCO BAY TO STOCKTON (JFB), CA. | 100,700 | 1,600 | 1,600 |
| N | SAN FRAN BAY TO STOCKTON,CA (J.F. BALDWIN & STOCK. SHIP CHAN) | 132,000 | 2,700 | 2,700 |
| FC | SAN LUIS REY RIVER, CA | 33,900 | 8,500 | 8,500 |
| FC | SWEETWATER RIVER, CA | 25,200 | 4,913 | 4,913 |
| FC | WALNUT CREEK, CA | 63,700 | 5,100 | 5,100 |
| FC | WILDCAT & SAN PABLO CREEKS, CA | 19,200 | 5,360 | 5,360 |
| COLORADO | | | | |
| FC | CHATFIELD LAKE, COLORADO | 95,000 | 300 | 300 |
| FC | FOUNTAIN CREEK, PUEBLO, CO | 6,270 | 2,500 | 2,500 |
| FLORIDA | | | | |
| BE | BROWARD CO (REIMB), FL | 22,300 | 556 | 556 |
| FC | CENTRAL & SOUTHERN FLORIDA, FL | 772,000 | 17,000 | 17,000 |
| FC | DADE COUNTY, FL | 47,400 | 3,000 | 3,000 |
| FC | DADE COUNTY, FL (N OF HAULOVER BEACH PARK) | 13,000 | 2,534 | 2,534 |
| BE | DUVAL COUNTY, FL | 19,700 | 5,000 | 5,000 |
| FC | FOUR RIVER BASINS, FL | 153,000 | 800 | 800 |
| N | JACKSONVILLE HARBOR, FL-MILL COVE | 3,950 | 2,968 | 2,958 |
| BE | PINELLAS COUNTY, FL | 18,700 | 3,000 | 3,000 |
| GEORGIA | | | | |
| MP | RICHARD B. RUSSELL DAM AND LAKE, GA AND. SC | 545,000 | 23,000 | 23,000 |
| N | SAVANNAH HARBOR WIDENING, GA | 7,560 | 2,800 | 2,800 |
| GUAM | | | | |
| FC | AGANA RIVER, GUAM | 4,090 | 2,500 | 2,500 |
| HAWAII | | | | |
| FC | KAHOMA STREAM, HI | 10,840 | 2,400 | 2,400 |
| ILLINOIS | | | | |
| FC | KASKASKIA ISLAND DRAINAGE AND LEVEE DISTRICT, IL | 14,100 | 2,100 | 2,100 |
| N | LOCKS & DAM NO. 26, IL & MO, SECOND LOCK | 214,000 | 4,000 | 4,000 |
| FC | MAUVAISE TERRE D&LD, IL | 1,499 | 419 | 419 |
| N | MISS. RIVER BTN OHIO & MO RIVERS (REGULATING WORKS), MO & IL | 182,000 | 3,800 | 4,300 |
| FC | ROCKFORD, ILLINOIS | 10,170 | 544 | 544 |
| N | SMITHLAND LOCKS AND DAM, IL, IN, & KY | 274,100 | 342 | 342 |
| FC | SOUTH QUINCY D&L DISTRICT, IL | 7,590 | 2,500 | 2,500 |
| INDIANA | | | | |
| FC | EVANSVILLE, IN | 49,000 | 4,500 | 4,500 |
| IOWA | | | | |
| FC | MISSOURI RIVER LEVEE SYSTEM, IA, NE, KS, & MO | 254,700 | 1,500 | 1,500 |
| KANSAS | | | | |
| FC | GREAT BEND, KS | 21,000 | 1,600 | 1,600 |
| FC | HALSTEAD, KS | 5,600 | 500 | 500 |
| KENTUCKY | | | | |
| FC | BIG SOUTH FORK NATIONAL RIVER & RECREATION AREA, KY&TN | 129,822 | 3,583 | 3,583 |
| FC | LEVISA & TUG FORKS OF BIG SANDY & CUMBERLAND RIVS, WV, VA & KY | 318,000 | 29,000 | 29,650 |
| FC | PAINTSVILLE LAKE, KY | 56,400 | 600 | 600 |
| FC | SOUTHWESTERN JEFFERSON COUNTY, KY | 57,700 | 6,500 | 6,500 |
| FC | TAYLORSVILLE LAKE, KY | 92,225 | 1,300 | 1,300 |
| FC | YATESVILLE LAKE, KY | 104,000 | 7,000 | 7,000 |

CAPABILITIES FOR CONSTRUCTION PROJECTS UNDERWAY

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| LOUISIANA | | | | |
| FC | GRAND ISLE & VICINITY, LA. | 13,489 | 1,968 | 1,968 |
| FC | LAKE PONTCHARTRAIN, LOUISIANA & VICINITY (HURRICANE PROTECTION) | 511,000 | 17,000 | 17,000 |
| FC | LAROSE TO GOLDEN MEADOW, LOUISIANA (HURRICANE PROTECTION) | 64,000 | 3,800 | 4,800 |
| N | MISS. RIVER, BATON ROUGE TO GULF OF MEXICO, LA. | 328,000 | 23,000 | 23,000 |
| N | MISSISSIPPI RIVER-GULF OUTLET, LA. | 492,000 | 500 | 500 |
| N | MISSISSIPPI RIVER SHIP CHANNEL GULF TO BATON ROUGE, LA. | 170,000 | 8,300 | 8,300 |
| FC | NEW ORLEANS TO VENICE, LA (HURRICANE PROTECTION) | 167,000 | 3,500 | 3,500 |
| N | RED RIVER WATERWAY-MS RIVER TO SHREVEPORT, LA. | 1,564,000 | 87,000 | 87,000 |
| MAINE | | | | |
| N | JONESPORT HARBOR, ME | 8,930 | 4,340 | 4,340 |
| MARYLAND | | | | |
| N | BALTIMORE HARBOR & CHANNELS, MD & VA - 1970 MODIFICATION | 179,000 | 47,000 | 47,000 |
| MASSACHUSETTS | | | | |
| BE | REVERE BEACH, MA | 6,525 | 2,450 | 2,450 |
| FC | TOWN BROOK, MA | 22,275 | 6,800 | 6,800 |
| MINNESOTA | | | | |
| FC | BASSETT CREEK, MN | 25,100 | 3,600 | 3,600 |
| FC | MANKATO AND NORTH MANKATO, MN | 95,100 | 8,000 | 8,000 |
| FC | SOUTH FORK ZUMBRO RIVER AT ROCHESTER, MN | 50,700 | 3,000 | 4,000 |
| MISSISSIPPI | | | | |
| FC | PEARL RIVER SLIDELL ST TAMMANY PARISH | 17,400 | 210 | 210 |
| FC | SOWASHEE CREEK MERIDIAN, MS 6/ | 13,640 | 6,000 | 6,000 |
| MISSOURI | | | | |
| FC | BLUE RIVER CHANNEL, KANSAS CITY, MISSOURI | 162,000 | 3,800 | 3,800 |
| MP | HARRY S TRUMAN DAM AND RESERVOIR, MO. | 550,000 | 6,200 | 6,200 |
| FC | LITTLE BLUE RIVER LAKES MISSOURI | 138,900 | 2,600 | 2,600 |
| N | LOCK & DAM NO. 26, ALTON, IL & MO. | 746,000 | 75,000 | 75,000 |
| NEBRASKA | | | | |
| FC | MISSOURI NATIONAL RECREATIONAL RIVER NE. & SD. | 21,000 | 100 | 100 |
| FC | PAPILLION CREEK AND TRIBUTARIES LAKES NE. | 52,800 | 2,500 | 3,500 |
| NEW HAMPSHIRE | | | | |
| N | PORTSMOUTH HBR & PISCATAQUA RIVER, NH, ME. | 14,175 | 7,500 | 7,500 |
| NEW JERSEY | | | | |
| N | BARNEGAT INLET, NJ. | 25,500 | 6,000 | 6,000 |
| N | KILL VAN KULL AND NEWARK BAY CHANNELS, NJ & NY. | 198,000 | 52,000 | 52,000 |
| FC | LIBERTY STATE PARK, LEVEE AND SEAWALL, NJ. | 19,100 | 6,000 | 6,000 |
| N | NEW YORK HARBOR, COLLECTION AND REMOVAL OF DRIFT, NY & NJ | 46,300 | 4,880 | 5,734 |
| NEW MEXICO | | | | |
| FC | ALBUQUERQUE NORTH DIVERSION, NM. | 690 | 354 | 354 |

CAPABILITIES FOR CONSTRUCTION PROJECTS UNDERWAY

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| NEW YORK | | | | |
| FC | ARDSLEY, NY | 5,310 | 1,300 | 1,300 |
| BE | EAST ROCKAWAY INLET TO ROCKAWAY INLET AND JAMAICA BAY, NY | 25,400 | 4,055 | 4,055 |
| FC | ELLICOTT CREEK, NY | 12,800 | 4,240 | 4,240 |
| N | MORICHES INLET, NY | 6,700 | 3,609 | 3,609 |
| N | PORT ONTARIO HARBOR, NY | 2,140 | 500 | 500 |
| NORTH CAROLINA | | | | |
| N | AIWW-REPLACEMENT OF FEDERAL HIGHWAY BRIDGES, NC | 55,300 | 0 | 250 |
| FC | B. EVERETT JORDAN DAM AND LAKE, NC | 135,820 | 10,600 | 10,600 |
| FC | CAROLINA BEACH AND VICINITY, NC | 16,252 | 800 | 800 |
| FC | FALLS LAKE, NC | 164,300 | 6,000 | 6,000 |
| NORTH DAKOTA | | | | |
| FC | LAKE DARLING, SOURIS RIVER, ND | 78,200 | 14,800 | 14,800 |
| OHIO | | | | |
| N | GENEVA ON THE LAKE, OH | 4,020 | 1,487 | 1,487 |
| FC | MILL CREEK, OH | 149,000 | 18,000 | 18,000 |
| FC | NEWARK, OHIO | 9,900 | 2,400 | 2,400 |
| OKLAHOMA | | | | |
| FC | ARCADIA LAKE, OK | 84,400 | 4,600 | 4,600 |
| OREGON | | | | |
| N | BONNEVILLE NAVIGATION LOCK, OR & WA | 200,300 | 40,000 | 40,000 |
| MP | BONNEVILLE SECOND POWERHOUSE, OR & WA | 565,300 | 6,000 | 6,000 |
| FC | ELK CREEK LAKE, OR | 120,300 | 55,000 | 55,000 |
| FC | LOWER COLUMBIA RIVER BASIN BANK PROTECTION, OR & WA | 25,300 | 1,100 | 1,100 |
| FC | WILLAMETTE RIVER BASIN BANK PROTECTION, OR | 29,700 | 1,100 | 1,100 |
| PENNSYLVANIA | | | | |
| FC | COWANESQUE LAKE, PA (MOD) | 2,570 | 138 | 138 |
| FC | FRANCIS E. WALTER DAM, PA-MODIFICATION | 11,700 | 3,900 | 3,900 |
| N | GRAYS LANDING LOCK AND DAM (LOCK AND DAM #7), PA | 123,300 | 3,300 | 6,800 |
| N | POINT MARION LOCK AND DAM (LOCK AND DAM #8), PA AND WV | 82,900 | 1,100 | 1,100 |
| BE | PRESQUE ISLE, PA (NOURISHMENT) | 16,301 | 1,250 | 1,250 |
| FC | TAMAQUA, PA | 8,700 | 3,000 | 3,000 |
| FC | TURTLE CREEK, PA | 17,076 | 1,000 | 1,000 |
| PUERTO RICO | | | | |
| N | PONCE HARBOR, PR | 7,220 | 6,233 | 6,233 |
| FC | PORTUGUES & BUCANA RIVERS, PR | 318,300 | 28,000 | 28,000 |
| TEXAS | | | | |
| FC | BOGGY CREEK, AUSTIN, TEXAS | 15,800 | 8,200 | 8,200 |
| FC | CLEAR CREEK, TX | 46,200 | 4,800 | 4,800 |
| FC | COOPER LAKE AND CHANNELS, TX | 135,300 | 14,000 | 20,200 |
| N | CORPUS CHRISTI SHIP CHANNEL, TX (1968 ACT) | 59,400 | 6,200 | 6,200 |
| FC | EL PASO, TX | 39,200 | 1,500 | 1,500 |
| N | FREEPORT HARBOR, TX (1970 ACT) | 59,400 | 11,400 | 11,400 |
| FC | JOE POOL LAKE, TX | 186,300 | 9,000 | 9,000 |
| FC | LAKE WICHITA, HOLLIDAY CREEK AT WICHITA FALLS, TX | 27,700 | 1,500 | 1,500 |
| N | MOUTH OF COLORADO RIVER, TX | 30,200 | 2,200 | 2,200 |
| FC | RAY ROBERTS LAKE, TX | 304,300 | 25,000 | 25,000 |
| FC | SAN ANTONIO CHANNEL IMPROVEMENT, TX | 123,000 | 25,000 | 32,500 |
| FC | TAYLORS BAYOU, TX | 61,300 | 3,700 | 3,700 |
| FC | VINCE AND LITTLE VINCE BAYOUS, TX | 20,100 | 2,147 | 2,147 |
| UTAH | | | | |
| FC | LITTLE DELL LAKE, UT | 28,300 | 5,500 | 5,500 |

## CAPABILITIES FOR CONSTRUCTION PROJECTS UNDERWAY

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| VIRGINIA | | | | |
| N | NORFOLK HARBOR, DEEPENING, VA. | 161,000 | 12,165 | 12,165 |
| FC | RICHMOND LOCAL PROTECTION, VA. | 77,280 | 10,000 | 10,000 |
| FC | VIRGINIA BEACH STREAMS, CANAL #2, VA. | 4,800 | 2,000 | 2,000 |
| BE | VIRGINIA BEACH, VA (1962 MODIFICATION) (REIMB) | 5,000 | 221 | 221 |
| WASHINGTON | | | | |
| MP | CHIEF JOSEPH ADDITIONAL UNITS, WA. | 403,000 | 3,000 | 3,000 |
| MP | LOWER SNAKE RIVER FISH & WILDLIFE COMPENSATION, WA, OR&ID. | 177,000 | 3,500 | 3,500 |
| FC | MT. ST. HELENS SEDIMENT CONTROL, WA. | 152,000 | 50,000 | 50,000 |
| WEST VIRGINIA | | | | |
| N | GALLIPOLIS L&D REPLACEMENT, OHIO RIVER, WV & OH. | 336,000 | 8,000 | 8,000 |
| FC | STONEWALL JACKSON LAKE, WV. | 208,000 | 14,500 | 14,500 |
| N | WINFIELD LOCKS AND DAM, KANAWHA RIVER, WV. | 153,000 | 1,750 | 1,750 |
| WISCONSIN | | | | |
| MP | UPPER MISS RVR SYSTEM ENVIR MGMT PROGRAM. | 196,000 | 4,168 | 4,168 |

## CAPABILITIES FOR MAJOR REHABILITATION & DAM SAFETY ASSURANCE PROJECTS UNDERWAY

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| ILLINOIS | | | | |
| N | BRANDON ROAD L/D (REHAB), ILLINOIS. | 23,500 | 1,914 | 1,914 |
| OHIO | | | | |
| DSA | MOHAWK DAM, MUSKINGUM RIVER RESERVOIRS (DAM SAFETY ASSURANCE) | 4,940 | 1,800 | 1,800 |
| FC | MUSKINGUM RIVER LAKES, OH (MAJOR REHAB). | 25,300 | 2,300 | 2,300 |
| PENNSYLVANIA | | | | |
| N | MONTGOMERY LOCKS AND DAM OHIO RIVER, PA. (MAJOR REHAB). | 33,200 | 7,700 | 7,700 |
| TEXAS | | | | |
| FC | BUFFALO BAYOU & TRIBS. (ADDICKS & BARKER) (DAM SAFETY ASSURANCE). | 9,500 | 3,100 | 3,100 |
| WASHINGTON | | | | |
| FC | MUD MOUNTAIN DAM, WA (DAM SAFETY ASSURANCE). | 43,800 | 2,100 | 2,100 |

CAPABILITIES FOR STUDIES UNDERWAY
MISSISSIPPI RIVER & TRIBUTARIES

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 19[illegible] APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| ARKANSAS | | | | |
| FDP | BOEUF-TENSAS BASIN SOUTH AR-NORTH LA | 6,570 | 825 | 825 |
| FDP | EASTERN ARKANSAS REGION COMPREHENSIVE STUDY, AR | 2,490 | 430 | 430 |
| FDP | ST. FRANCIS RIVER, MO & AR (FISH & WILDLIFE) | 985 | 0 | 360 |
| KENTUCKY | | | | |
| FDP | MISSISSIPPI RIVER - EAST BANK LEVEES, KY & TN | 1,170 | 0 | 290 |
| FDP | OBION AND FORKED DEER RIVERS AND TRIBUTARIES, TN & KY | 1,580 | 400 | 400 |
| LOUISIANA | | | | |
| FDP | ATCHAFALAYA BASIN (WATER & LAND RESOURCES), LA | 6,551 | 65 | 65 |
| MISSISSIPPI | | | | |
| FDP | TUSCUMBIA RIVER BASIN, MS | 1,000 | 200 | 200 |
| FDP | YAZOO RIVER BASIN MS | 9,440 | 513 | 513 |
| TENNESSEE | | | | |
| FDP | REELFOOT LAKE, TN | 1,255 | 290 | 290 |
| FDP | TIPTONVILLE, TN | 435 | 104 | 104 |

CAPABILITIES FOR CONTINUING PRECONSTRUCTION ENGINEERING & DESIGN
MISSISSIPPI RIVER & TRIBUTARIES

| | | | | |
|---|---|---|---|---|
| ARKANSAS | | | | |
| FC | LOWER WHITE RIVER, AR (BIG CREEK & TRIBS) | 2,550 | 400 | 400 |
| LOUISIANA | | | | |
| FC | BUSHLEY BAYOU AREA LA | 1,140 | 105 | 105 |
| FC | EASTERN RAPIDES & SOUTH CENTRAL AVOYELLES PARISHES, LA | 4,400 | 1,350 | 1,350 |
| FC | MISSISSIPPI & LOUISIANA ESTUARINE AREAS, LA & MS | 3,300 | 389 | 389 |
| MISSISSIPPI | | | | |
| FC | HORN LAKE CREEK & TRIBS INCLUDING COWPEN CREEK, MS & TN | 670 | 211 | 211 |
| FDP | MISS RIV,EAST BANK, VICKSBURG - YAZOO AREA, MS (PHASE 1) | 385 | 0 | 170 |
| MISSOURI | | | | |
| FC | ST JOHNS BAYOU AND NEW MADRID FLOODWAY, MO | 3,200 | 572 | 572 |
| TENNESSEE | | | | |
| FC | NONCONNAH CREEK, TN & MS | 1,400 | 231 | 231 |

CAPABILITIES FOR CONSTRUCTION PROJECTS UNDERWAY
MISSISSIPPI RIVER & TRIBUTARIES

(AMOUNTS IN THOUSANDS)

| TYPE | PROJECT OR SURVEY | ESTIMATED FEDERAL COST | FY 1988 APPROVED BUDGET | FY 1988 CAPABILITY |
|---|---|---|---|---|
| ARKANSAS | | | | |
| FC | EIGHT MILE CREEK, AR.......................... | 10,000 | 450 | 450 |
| FC | MISSISSIPPI RIVER LEVEES, AR, IL, KY, .. LA, MS, MO & TN.......................... | 1,218,000 | 26,500 | 29,000 |
| FC | ST. FRANCIS BASIN, LITTLE RIVER ......... DRAINAGE.......................... | 58,869 | 1,208 | 1,308 |
| FC | ST. FRANCIS BASIN, ST. FRANCIS RIVER & . TRIBS.......................... | 302,146 | 8,292 | 9,767 |
| FC | TENSAS BASIN, LAKE CHICOT PUMPING PLANT, AR.......................... | 95,300 | 2,645 | 2,645 |
| LOUISIANA | | | | |
| (FC | ATCHAFALAYA BASIN FLOODWAY SYSTEM........ | 136,000 | 3,500 | 3,500 |
| FC | ATCHAFALAYA BASIN, LA.................... | 1,423,000 | 37,600 | 37,600 |
| FC | BAYOU COCODRIE AND TRIBUTARIES, LA....... | 19,800 | 100 | 100 |
| FC | CHANNEL IMPROVEMENT, DREDGING............ | 223,845 | 0 | 2,000 |
| FC | CHANNEL IMPROVEMENT, DIKES............... | 612,320 | 10,500 | 13,600 |
| FC | CHANNEL IMPROVEMENT, REVETMENTS & ....... FORESHORE.......................... | 2,171,835 | 73,500 | 73,500 |
| FC | TENSAS BASIN, BOEUF & TENSAS RIVERS, LA. | 129,700 | 300 | 300 |
| FC | TENSAS BASIN, RED RIVER BACKWATER AREA,. LA.......................... | 163,600 | 2,700 | 4,200 |
| FC | TENSAS BASIN, TENSAS-COCODRIE PUMPING .. STATION, LA.......................... | 55,400 | 455 | 455 |
| MISSISSIPPI | | | | |
| FC | YAZOO BASIN, TRIBS - ALL EXCEPT ......... ASCALMORE-TIPPO & OPPOSSUM BAYOU....... | 201,500 | 8,700 | 8,700 |
| FC | YAZOO BASIN, BIG SUNFLOWER RIVER (INCL . STEELE BAYOU BASIN).......................... | 103,000 | 2,400 | 2,400 |
| | YAZOO BASIN, DEMONSTRATION EROSION ...... CONTROL.......................... | 27,900 | 5,300 | 5,300 |
| FC | YAZOO BASIN, YAZOO BACKWATER............. | 239,000 | 225 | 225 |
| FC | YAZOO BASIN, TRIBS - ASCALMORE-TIPPO & . OPOSSUM BAYOUS.......................... | 36,500 | 200 | 200 |
| FC | YAZOO BASIN, UPPER YAZOO PROJECTS........ | 360,427 | 10,275 | 10,275 |
| TENNESSEE | | | | |
| FC | WEST TENNESSEE TRIBUTARIES TN............ | 39,000 | 5,100 | 5,300 |

CAPABILITIES FOR MAJOR REHABILITATION & DAM SAFETY ASSURANCE PROJECTS UNDERWAY
MISSISSIPPI RIVER & TRIBUTARIES

| | | | | |
|---|---|---|---|---|
| MISSISSIPPI | | | | |
| FC | SARDIS DAM, MS.......................... | 7,100 | 2,800 | 2,800 |

## SMALL PROJECTS PROGRAMS

Senator JOHNSTON. Provide for the record a list of each of the Small Projects, Continuing Authority Programs similar to that provided last year.

General HEIBERG. Yes; we can provide that. However, you should be aware of the dynamic nature of these programs. The values shown represent the Corps of Engineers estimate as of January 31, 1987. As studies proceed and costs and benefits are determined, some activities will be terminated and others not listed may be initiated. furthermore, we are managing each program to in sure that only projects having predominately flood control and commercial navigation outputs proceed to construction. If I may, Mr. Chairman, I would like to insert it for the record.

[The information as follows:]

ACTUAL AND PENDING ALLOCATION FOR SMALL PROJECTS PROGRAMS
(Funds Shown in $1,000)

| Program/Category/Item | Fiscal Year 1987 | Fiscal Year 1988 |
|---|---|---|
| EMERGENCY STREAMBANK AND SHORELINE PROTECTION (Section 14) | | |
| Reconnaissance Studies | 1,000 | 1,300 |
| Plans and Specifications | | |
| Marina Outfall Sewer, Marina, CA | 6 | |
| Paint Rock River Jackson Rd., IN | 5 | |
| Grand River, Redding Br., IA | 11 | |
| Iowa River, Wapello, IA | 8 | |
| Little Sioux River, Anthon, IA | 6 | |
| Fountain Creek, Pinon Br., Ozark Co., MO | 10 | |
| San Vicenta Arroyo, Silver City, NM | 24 | |
| Ohio River, Williamstown, WV | 3 | |
| Projects Not Yet Identified | 77 | 1,200 |
| Subtotal P&S | 150 | 1,200 |
| Construction | | |
| Chattahoochee River, Eufaula, AL | 190 | |
| Tennessee River, Sheffield, AL | 213 | |
| South Platte River, Ft. Lupton, CO | 33 | |
| Ft. Clinch State Park, FL | 351 | |
| Illinois River, Hardin, IL | 136 | |
| Lake Michigan, Lake Forest, IL | 136 | |
| Rock River, 320th St. N. Rock Island, IL | 65 | |
| Rosewood Beach, Highland Park, IL | 167 | |
| Middle River, P-48 Bridge, IA | 100 | |
| Turkey River, Jefferson Twp, IA | 42 | |
| Turkey River, Millville Twp, IA | 28 | |
| Baldwin City Waterline, KS | 100 | |
| Cumberland River, Canton, KY | 186 | |
| Little Blue River, Marshall Co., KS | 54 | |
| Machias River, Machias, ME | 130 | |
| Marginal Way, Ogunquit, ME | 187 | |
| Pleasant Point, Perry, ME | 135 | |
| Covered Bridge, Sheffield, MA | 153 | |
| South River, Conway, MA | 50 | |
| Bridgeport, MI | 71 | |
| Lake Michigan, Grand Haven, MI | 107 | |
| Crow River, Hanover, MN | 100 | |
| Big Brown Creek Marietta - Hazeldell Rd. Br.(s), MS | 75 | |
| Corinth, MS | 50 | |
| Goodfood Creek, Chickasaw Co., MS | 60 | |
| Martin Creek, Prentiss Co., MS | 40 | |
| Relief Bridge, Noxubee Co., MS | 75 | |
| Tallabinnela Creek, Chickasaw Co., MS | 60 | |
| Tynes Branch, Houston School Rd. Br. Crossing, MS | 25 | |
| Bryant River, Warren Br., Ozark Co., MO | 15 | |
| Nodaway River, Andrew Co., MO | 73 | |
| Logan Creek, Bancroft, NE | 40 | |

## ACTUAL AND PENDING ALLOCATION FOR SMALL PROJECTS PROGRAMS
(Funds Shown in $1,000)

| | Fiscal Year | |
|---|---|---|
| Program/Category/Item | 1987 | 1988 |
| EMERGENCY STREAMBANK AND SHORELINE PROTECTION (Section 14) | | |
| Construction (Cont'd) | | |
| Muddy Creek, Syracuse, NE | 16 | |
| Niobrara River, Carns Br., Bassett, NE | 80 | |
| Webster Co., Br., 23015, NE | 4 | |
| Webster Co., Br., 43430, NE | 5 | |
| Platte River, Camp Ashland, NE | 112 | |
| San Francisco, Reserve, NM | 47 | |
| Seneca River, Seneca Falls, NY | 100 | |
| Sheyenne River, Valley City, ND | 72 | |
| Souris River, Velva, ND | 95 | |
| Chagrin River, Kirkland, OH | 50 | |
| Geneva, State Route 531, OH | 100 | |
| Mahoning River, Warren Twp, OH | 88 | |
| Ohio River, Gallipolis, OH | 50 | |
| Andarko (WWT), OK | 129 | |
| Baron Fork, Camp Egan, Ok | 146 | |
| City Park, Andarko, Ok | 72 | |
| Deer Creek, OK | 177 | |
| Salt Fork, Red River, Elmer, OK | 50 | |
| Beaver River, Bridgewater, PA | 159 | |
| Clear and Burnt River, Baker Co., OR | 11 | |
| Chartiers Creek, Kennedys and McKees Boroughs, PA | 226 | |
| Darby Creek, Lansdowne Borough, PA | 118 | |
| El Terraplen, Hwy 187, PR | 183 | |
| Cooper River, Berkeley, Co., SC | 175 | |
| Marne Creek, Yankton, SD | 98 | |
| Lewis Branch, Houston Co., TN | 100 | |
| Nonconnah Creek, Lamar Ave., Memphis, TN | 210 | |
| Tennessee River, Downtown Island Airport, TN | 63 | |
| Tennessee River, Paris Landing State Park, TN | 122 | |
| Mill Brook, Brownville, VT | 45 | |
| Saxis Island, VA | 215 | |
| Dunbar, WV | 115 | |
| Elk Creek, Clarksburg, WV | 52 | |
| Monongahela River, Granville, WV | 208 | |
| Ohio River, Brooke Co., WV | 98 | |
| Lake Michigan, Cleveland, WI | 69 | |
| Lake Michigan, Cudahy, WI | 31 | |
| Projects Not Yet Identified | 62 | 3,300 |
| Subtotal Construction | 7,000 | 3,300 |
| Contingencies | 18 | 3,200 |
| TOTAL PROGRAM (SECTION 14) | 8,168 | 9,000 |

## ACTUAL AND PENDING ALLOCATION FOR SMALL PROJECTS PROGRAMS
(Funds Shown in $1,000)

| Program/Category/Item | Fiscal Year | |
|---|---|---|
| | 1987 | 1988 |
| BEACH EROSION (Section 103) | | |
| Reconnaissance Studies | 700 | 300 |
| Detailed Project Studies | | |
| North Beach, Calvert Co., MD | 50 | |
| Conimicut Point, Warwick, RI | 25 | |
| Projects Not Yet Identified | 125 | 150 |
| Subtotal DPS | 200 | 150 |
| Plans and Specifications | | |
| Projects Not Yet Identified | 200 | 150 |
| Subtotal | 200 | 150 |
| Construction | | |
| Dunedin Bay Shoreline, FL | 750 | |
| North Indian River Inlet, DE | 100 | 350 |
| Key Biscayne, Miami, FL | 800 | |
| South Indian River Inlet, DE | 100 | 550 |
| Projects Not Yet Identified | 350 | 850 |
| Subtotal Construction | 2,100 | 1,750 |
| Contingencies | 1,605 | 150 |
| Total Program (Section 103) | 4,805 | 2,500 |
| NAVIGATION (Section 107) | | |
| Reconnaissance Studies | 1,300 | 1,000 |
| Detailed Project Studies | | |
| Chignik, AK | 7 | |
| Larsen Bay, AK | 46 | |
| Hooper Bay, AK | 40 | |
| Tenneessee River, Florence, AL | 20 | |
| Valona Harbor, McIntosh, Co., GA | 37 | |
| Kahului, Maui, HI | 30 | |
| Laupahoehoe, HI | 12 | |
| Tennessee River, Morgan Co., KY | 30 | |
| Merizo Harbor | 12 | |
| Provincetown Harbor, MA | 30 | |
| Scituate Harbor, MA | 40 | |
| Plymouth Harbor, Plymouth, MA | 25 | |
| Winthrop Harbor, Winthrop, MA | 40 | |
| Green Harbor, MA | 65 | |
| Wood Island Harbor, Biddeford, MA | 55 | |
| Perkins Cove, Ogunquit, ME | 15 | |
| Bass Harbor, Tremont, ME | 65 | |
| Point Judith, RI | 30 | |
| Gloucester Harbor, Gloucester, MA | 20 | |
| Harkers Island, Carteret Co., NC | 65 | |

## ACTUAL AND PENDING ALLOCATION FOR SMALL PROJECTS PROGRAMS
(Funds Shown in $1,000)

| | Fiscal Year | |
|---|---|---|
| | 1987 | 1988 |
| NAVIGATION (Section 107) | | |
| Reconnaissance Studies | 1,300 | 1,000 |
| Detailed Project Studies | | |
| Columbia River, Henrici Bar, OR | 36 | |
| Coquille River, Bandon, QR | 15 | |
| Brookgreen Gradens, SC | 5 | |
| Columbia River, Longview, WA | 32 | |
| Columbia River, Kalama, WA | 28 | |
| Projects Not Yet Identified | 470 | 1,000 |
| Subtotal DPS | 1,270 | 1,000 |
| Program/Category/Item | | |
| NAVIGATION (Section 107) | | |
| Plans and Specifications | | |
| Little Rockport Harbor, Pulaski, AR | 15 | |
| Rockhouse Creek, FL | 53 | |
| Kahului, Mau, HI | 50 | 80 |
| Southeast Missouri Port, MO | 110 | |
| Tombigbee River, Columbus, MS | 30 | |
| Sturgeon Point, NY | 137 | |
| Brookgreen Gardens, SC | 10 | |
| Projects Not Yet Identified | 895 | 1,020 |
| Subtotal P&S | 1,300 | 1,100 |
| Construction | | |
| Little Rockport Harbor, Pulaski, AR | 827 | |
| Agat Harbor, GU | 1,196 | 410 |
| Rockport Harbor, Rockport, MA | 850 | |
| Lower Thorofare, Somerset Co., MD | 245 | |
| Tombigbee River, Columbus, MS | 440 | |
| Sturgeon Point, NY | | 810 |
| Lorain Harbor, Lorain, OH | 450 | |
| Rudee Inlet, Virginia Beach, VA | 200 | 665 |
| Projects Not Yet Identified | 572 | 3,015 |
| Subtotal Construction | 4,780 | 4,900 |
| Contingencies | 1,022 | 2,000 |
| Total Program (Section 107) | 9,672 | 10,000 |

## ACTUAL AND PENDING ALLOCATION FOR SMALL PROJECTS PROGRAMS
(Funds Shown in $1,000)

| Program/Category/Item | Fiscal Year 1987 | Fiscal Year 1988 |
|---|---|---|
| MITIGATION FOR NAVIGATION PROJECTS (Section 111) | | |
| Reconnaissance Studies | 50 | 50 |
| Detailed Project Studies | | |
| Charleston Harbor, SC | | 25 |
| Projects Not Yet Identified | | 100 |
| Subtotal | | 125 |
| Plans and Specifications | | |
| Projects Not Yet Identified | | 75 |
| Construction | | |
| Herring Creek, Tall Timbers, MD | 80 | |
| Projects Not Yet Identified | | 100 |
| Subtotal Construction | 80 | 100 |
| Contingencies | 158 | 150 |
| Total Program (Section 111) | 288 | 500 |
| Program/Category/Item | | |
| FLOOD CONTROL (Section 205) | | |
| Reconnaissance Studies | 4,000 | 4,000 |
| Detailed Project Studies | | |
| Rialto Channel, Rialto, CA | 123 | |
| Morrison Creek, CA | 40 | |
| Lake Elsinore, Riverside Co., CA | 90 | |
| Quinnipiac River, Wallingford, CT | 85 | |
| Wepawaug River, Milford, CT | 10 | |
| Mad River Industrial Area, Waterbury, CT | 100 | 50 |
| Casey Canal, Savannah, GA | 10 | |
| Placentia Canal, Savannah, GA | 10 | |
| Springfield Canal, GA | 70 | |
| Plainfield, IA | 20 | |
| Tama, IA | 50 | 39 |
| Raccoon River, Des Moine, IA | 18 | |
| Valleyview, IL | 48 | |
| Fox River, Mchenry Co., IL | 79 | |
| Liverpool, IL | 30 | |
| Iroquois River and Sugar Creek, Watseka, IL | 83 | |
| Ottawa, IL | 85 | |
| Wilmington, IL | 89 | |
| Licking River, Salyersville, KY | 39 | |
| Lincoln Draw, Hays, KS | 40 | |
| Ontonagon, MI | 56 | |
| Marion Co., Drainage District, MO | 50 | |

## ACTUAL AND PENDING ALLOCATION FOR SMALL PROJECTS PROGRAMS
(Funds Shown in $1,000)

| | Fiscal Year | |
|---|---|---|
| Program/Category/Item | 1987 | 1988 |
| FLOOD CONTROL (Section 205) | | |
| Reconnaissance Studies | 4,000 | 4,000 |
| Detailed Project Studies | | |
| Arrostook River, Ft. Fairfield, MA | 50 | |
| Snake River, Alvarado, MN | 50 | |
| Gilmore Creek, Winona, MN | 40 | |
| Lake Charlotte, MN | 18 | |
| Great Coharie Creek, NC | 30 | |
| Crabtree Creek and Tributaries, Wake Co., NC | 95 | 24 |
| English Coulee, Grand Forks, ND | 50 | |
| Dry Creek, Lindsay, NE | 32 | |
| Conklin-Broome (Ice Jam), NY | 70 | |
| Canandaigua Lake Outlet Modification, NY | 90 | |
| Blacklick Creek, Franklin Co., OH | 115 | 125 |
| Coal Creek, Henryetta, OK | 30 | |
| Squirrel Hollow Creek, Sand Springs, OK | 35 | |
| Coal Bank Slough, Kibby Dike, Coos Bay, OR | 25 | |
| Warrenton Diking District, OR | 136 | |
| Naguabo River, PR | 100 | |
| Dry Creek, Goodlettsville, TN | 15 | |
| Browns Creek, Nashville, TN | 5 | |
| Burton Creek, Bryan, TX | 60 | |
| Elm Fork, Gainesville, TX | 59 | |
| Pecan Creek, Gainesville, TX | 10 | |
| Walnut Creek, Tributary 7, Austin, TX | 25 | |
| Little Walnut Creek, Austin, TX | 25 | |
| Elwha Klallam Reservation, WA | 10 | |
| Peters Creek, Roanoke, VA | 160 | 60 |
| Marsh Fork, Fairdale, WV | 65 | 100 |
| Hughes Creek Hugheston, WV | 50 | |
| Projects Not Yet Identified | 1,825 | 2,602 |
| Subtotal DPS | 4,500 | 3,000 |
| FLOOD CONTROL (Section 205) | | |
| Plans and Specifications | | |
| Cribbs Mill Creek, Tuscalosa, AL | 80 | |
| Eslava Creek, Mobile, AL | 30 | |
| White River, Batesville, AR | 70 | |
| Lake Susupe, Saipan, CN | 190 | |
| Garapan area, Saipan, CN | 200 | |
| West River, New Haven, CT | 150 | |
| Rippowan River, Stamford, CT | 120 | |
| Waverly, IA | 204 | |
| Bayou Natchitoches, LA | 73 | |
| Allegheny River, Oil City, PA | 100 | |
| Riverdale, West Springfield, MA | 50 | |
| Point of Pines, Revere, MA | 50 | |
| Emerson, Manitoba-Noyes, MN | 15 | |
| Minnesota River, Henderson, MN | 135 | |
| St. Peters, MO | 30 | |
| Lodgepole Creek, Sidney, NE | 160 | |

ACTUAL AND PENDING ALLOCATION FOR SMALL PROJECTS PROGRAMS
(Funds Shown in $1,000)

| | Fiscal Year | |
|---|---|---|
| Program/Category/Item | 1987 | 1988 |
| FLOOD CONTROL (Section 205) | | |
| Plans and Specifications (Cont'd) | | |
| Winnipesaukee River, NH | 350 | |
| Oneida Creek, NY | 20 | |
| Cazenovia Creek, Buffalo, NY | 100 | |
| Delaware River, Port Jervis, NY | 90 | |
| Clatsop Co., Diking Districts 2 and 5, OR | 25 | |
| Lorean Branch, Hurst, TX | 20 | |
| Savan Gut, St. Thomas, VI | 60 | |
| Projects Not Yet Identified | 1,278 | 3,500 |
| Subtotal P&S | 3,600 | 3,500 |
| Construction | | |
| Murder Creek, Brewton, AL | 400 | |
| Little Red River, Clinton, AR | 82 | |
| Telegraph Canyon Creek, San Diego Co., CA | 1,000 | 2,500 |
| South Fork Santa Clara River, CA | | 1,500 |
| Los Coches Creek, CA | 1,400 | |
| Canoe Creek, Henderson, KY | 70 | |
| Paw Paw Lake, MI | 100 | |
| Lake Pulaski, Buffalo, MN | 760 | |
| Middle River, Argyle, MN | 650 | |
| Leaf and Bowie Rivers, Hattiesburg, MS | 160 | |
| Ararat River, NC | 292 | |
| Devils Lake, ND | 75 | |
| Red River, Argusville, ND | 500 | |
| Pebble Creek, Scribner, NE | 94 | |
| Beaver Brook, Keene, NH | 200 | |
| Passaic River Basin, NJ | 400 | |
| Conesus Lake, Livonia, NY | 900 | |
| Penneypack Creek, Hatboro, PA | 300 | |
| West Little Pine Creek, Etna, PA | 1,500 | |
| Poquessing Creek, Bucks Co., PA | 450 | |
| Guanajibo River, Sabana Grande, PR | 1,050 | 1,600 |
| Scotts Creek, Newberry Co., SC | 166 | |
| Humboldt, TN | 327 | |
| White Oak Creek, Sunbright, TN | 23 | |
| Kirbyville, TX | 300 | 1,000 |
| Lorean Branch, Hurst, TX | 200 | 2,000 |
| Stuart, VA | 1,140 | |
| Projects Not Yet Identified | 2,961 | 6,400 |
| Subtotal Construction | 15,500 | 15,000 |
| Contingencies | 2,958 | 4,500 |
| TOTAL PROGRAM (Section 205) | 30,558 | 30,000 |

## ACTUAL AND PENDING ALLOCATION FOR SMALL PROJECTS PROGRAMS
(Funds Shown in $1,000)

| Program/Category/Item | Fiscal Year 1987 | Fiscal Year 1988 |
|---|---|---|
| SNAGGING AND CLEARING (Section 208) | | |
| Reconnaissance Studies | 400 | 300 |
| Detailed Project Studies | | |
| Plans and Specifications | | |
| Projects Not Yet Identified | 50 | 100 |
| Construction | | |
| Projects Not Yet Identified | 300 | 400 |
| Contingencies | 403 | 200 |
| TOTAL PROGRAM (Section 208) | 1,153 | 1,000 |

### BUDGET AUTHORITY AND OUTLAY TRENDS

Senator JOHNSTON. Provide for the record an updated tabulation, similar to last year, showing outlays of the various appropriation accounts thru 1986.

Mr. DAWSON. Sir, we will provide an updated tabulation of budgetary authority and outlays for the record as we did last year.

[the information follows:]

OUTLAY TRENDS (1)
($000)

| BUDGET AUTHORITY AND OUTLAYS | GENERAL INVESTIGATIONS | CONSTRUCTION, GENERAL (2) | OPERATION AND MAINTENANCE, GENERAL (3) | MISSISSIPPI RIVER AND TRIBUTARIES | GENERAL EIPENSES | FLOOD CONTROL AND COASTAL EMERGENCIES | PERMANENT APPROPRIATIONS | RIVER & HARBOR CONTRIBUTED FUND | INLAND WATERWAY TRUST FUND | GROSS TOTAL (4) |
|---|---|---|---|---|---|---|---|---|---|---|
| FY 1977 BUDGET AUTHORITY | 71,920 | 1,430,195 | 669,600 | 231,497 | 49,050 | 22,140 | 6,026 | 31,463 | 0 | 2,511,891 |
| TOTAL OUTLAYS | 69,818 | 1,316,039 | 640,627 | 220,072 | 49,991 | 40,857 | 2,742 | 33,775 | 0 | 2,373,921 |
| OUTLAYS FROM PRIOR YEAR AUTHORITY | 15,403 | 499,196 | 95,342 | 82,264 | 2,403 | 23,569 | 2,694 | 30,959 | 0 | 751,830 |
| OUTLAYS FROM NEW BUDGET AUTHORITY | 54,415 | 816,843 | 545,285 | 137,808 | 47,588 | 17,288 | 48 | 2,816 | 0 | 1,622,091 |
| FY 1978 BUDGET AUTHORITY | 107,046 | 1,537,820 | 774,870 | 253,081 | 60,000 | 18,000 | 11,720 | 39,153 | 0 | 2,801,690 |
| TOTAL OUTLAYS | 96,145 | 1,428,768 | 762,447 | 224,679 | 55,998 | 5,663 | 6,061 | 38,500 | 0 | 2,618,261 |
| OUTLAYS FROM PRIOR YEAR AUTHORITY | 17,504 | 634,817 | 126,812 | 93,688 | 1,366 | 5,663 | 6,013 | 28,856 | 0 | 914,719 |
| OUTLAYS FROM NEW BUDGET AUTHORITY | 78,641 | 793,951 | 635,635 | 130,991 | 54,632 | 0 | 48 | 9,644 | 0 | 1,703,542 |
| FY 1979 BUDGET AUTHORITY | 137,978 | 1,343,711 | 836,400 | 223,035 | 68,900 | 126,000 | 8,239 | 34,892 | 0 | 2,779,155 |
| TOTAL OUTLAYS | 124,293 | 1,610,451 | 809,999 | 233,613 | 64,800 | 19,277 | 12,975 | 31,077 | 0 | 2,906,485 |
| OUTLAYS FROM PRIOR YEAR AUTHORITY | 28,404 | 745,297 | 139,237 | 122,091 | 5,202 | 19,277 | 11,695 | 29,510 | 0 | 1,100,713 |
| OUTLAYS FROM NEW BUDGET AUTHORITY | 95,889 | 865,154 | 670,762 | 111,522 | 59,598 | 0 | 1,280 | 1,567 | 0 | 1,805,772 |
| FY 1980 BUDGET AUTHORITY | 142,145 | 1,659,752 | 945,580 | 210,515 | 76,800 | 170,000 | 6,410 | 40,504 | 0 | 3,251,706 |
| TOTAL OUTLAYS | 138,836 | 1,655,120 | 890,229 | 246,502 | 71,231 | 156,420 | 6,923 | 34,430 | 0 | 3,199,691 |
| OUTLAYS FROM PRIOR YEAR AUTHORITY | 42,088 | 478,562 | 165,638 | 111,513 | 8,616 | 144,821 | 6,923 | 33,324 | 0 | 991,485 |
| OUTLAYS FROM NEW BUDGET AUTHORITY | 96,748 | 1,176,558 | 724,591 | 134,989 | 62,615 | 11,599 | 0 | 1,106 | 0 | 2,208,206 |
| FY 1981 BUDGET AUTHORITY | 134,013 | 1,593,892 | 972,905 | 237,519 | 86,630 | 25,000 | 6,778 | 81,032 | 0 | 3,137,769 |
| TOTAL OUTLAYS | 143,951 | 1,518,418 | 985,477 | 265,099 | 89,226 | 104,352 | 6,336 | 83,846 | 0 | 3,196,705 |
| OUTLAYS FROM PRIOR YEAR AUTHORITY | 45,399 | 455,496 | 218,489 | 75,526 | 13,721 | 104,352 | 6,288 | 39,189 | 0 | 958,460 |
| OUTLAYS FROM NEW BUDGET AUTHORITY | 98,552 | 1,062,922 | 766,988 | 189,573 | 75,505 | 0 | 48 | 44,657 | 0 | 2,238,245 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| FY 1982 BUDGET AUTHORITY | 137,225 | 1,429,992 | 1,025,335 | 256,310 | 96,000 | 40,000 | 12,191 | 62,876 | 0 | 3,059,929 |
| TOTAL OUTLAYS | 130,385 | 1,452,572 | 980,797 | 246,755 | 83,850 | 36,806 | 6,771 | 65,380 | 0 | 3,003,316 |
| OUTLAYS FROM PRIOR YEAR AUTHORITY | 35,461 | 530,970 | 205,082 | 47,946 | 8,423 | 36,806 | 6,723 | 36,375 | 0 | 907,786 |
| OUTLAYS FROM NEW BUDGET AUTHORITY | 94,924 | 921,602 | 775,715 | 198,809 | 75,427 | 0 | 48 | 29,005 | 0 | 2,095,530 |
| FY 1983 BUDGET AUTHORITY | 139,042 | 1,508,405 | 1,206,309 | 403,052 | 100,100 | 54,877 | 9,524 | 43,700 | 0 | 3,465,009 (5) |
| TOTAL OUTLAYS | 138,029 | 1,258,237 | 1,102,840 | 284,201 | 103,723 | 45,685 | 12,222 | 45,387 | 0 | 2,990,324 |
| OUTLAYS FROM PRIOR YEAR AUTHORITY | 42,301 | 508,390 | 250,387 | 57,501 | 20,387 | 45,685 | 12,174 | 33,871 | 0 | 970,696 |
| OUTLAYS FROM NEW BUDGET AUTHORITY | 95,728 | 749,847 | 852,453 | 226,700 | 83,336 | 0 | 48 | 11,516 | 0 | 2,019,628 |
| FY 1984 BUDGET AUTHORITY | 135,810 | 926,804 | 1,190,492 | 302,480 | 105,800 | 10,000 | 9,779 | 54,321 | 0 | 2,735,486 |
| TOTAL OUTLAYS | 138,621 | 1,102,701 | 1,287,245 | 394,861 | 104,331 | 36,821 | 9,495 | 50,240 | 0 | 3,124,315 |
| OUTLAYS FROM PRIOR YEAR AUTHORITY | 43,314 | 758,558 | 353,856 | 176,352 | 16,672 | 36,821 | 9,453 | 32,184 | 0 | 1,427,210 |
| OUTLAYS FROM NEW BUDGET AUTHORITY | 95,307 | 344,143 | 933,389 | 218,509 | 87,659 | 0 | 42 | 18,056 | 0 | 1,697,105 |
| FY 1985 BUDGET AUTHORITY | 141,400 | 947,500 | 1,307,600 | 321,800 | 115,000 | 50,000 | 12,906 | 49,729 | 7,800 | 2,953,735 |
| TOTAL OUTLAYS | 138,105 | 1,033,018 | 1,314,551 | 328,240 | 110,084 | 39,318 | 9,912 | 45,493 | 0 | 3,018,721 |
| OUTLAYS FROM PRIOR YEAR AUTHORITY | 40,503 | 582,661 | 257,103 | 83,971 | 17,424 | 31,845 | 9,753 | 36,265 | 0 | 1,059,525 |
| OUTLAYS FROM NEW BUDGET AUTHORITY | 97,602 | 450,357 | 1,057,448 | 244,269 | 92,660 | 7,473 | 159 | 9,228 | 0 | 1,959,196 |
| FY 1986 BUDGET AUTHORITY | 123,478 | 879,830 | 1,260,248 | 301,225 | 105,399 | 48,925 | 14,626 | 49,064 | 0 | 2,782,795 |
| TOTAL OUTLAYS | 130,901 | 908,288 | 1,314,182 | 329,656 | 109,770 | 27,065 | 12,950 | 46,058 | 0 | 2,878,870 |
| OUTLAYS FROM PRIOR YEAR AUTHORITY | 43,797 | 497,143 | 250,152 | 77,528 | 22,980 | 27,065 | 12,904 | 40,501 | 0 | 972,070 |
| OUTLAYS FROM NEW BUDGET AUTHORITY | 87,104 | 411,145 | 1,064,030 | 252,128 | 86,790 | 0 | 46 | 5,557 | 0 | 1,906,800 |

(1) Table assumes funds carried over into the year are outlayed first.
(2) Includes the Consolidated Working Fund.
(3) Includes Special Recreation Use Fees.
(4) Does not include the Revolving Fund because outlays include positive outlays from prior year authority, new budget authority, and the corpus of the fund. Income to the fund is posted as a negative outlay. It would be difficult to separate these.
(5) Reflects late receipt of P. L. 98-8 (Jobs Bill) appropriations.

## ANNUAL FLOOD DAMAGE REPORT

Senator JOHNSTON . Provide for the record the annual flood damage report, including a table showing the damages prevented by State as the result of Corps of Engineers activities.

Mr. DAWSON. If I may, Mr. Chairman, I would like to insert for the record my letter to you providing this information.

[The information as follows:]

**DEPARTMENT OF THE ARMY**
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, DC 20310-0103

Honorable J. Bennett Johnston
Chairman
Subcommittee on Energy and
  Water Development
Committee on Appropriations
United States Senate
Washington, D.C. 20510-1801

13 FEB 1987

Dear Mr. Chairman:

This letter transmits the fourth Annual Flood Damage Report (enclosure), prepared in response to House Committee Report 98-217, Energy and Water Appropriations Act, 1984. The report provides information on a fiscal year basis and details flood damages, acres inundated, loss of life, and damages prevented by the Army Corps of Engineers flood control measures. Assessments of damages resulting from other natural disasters are also given. All data are listed on a state-by-state basis. Flood damages prevented by Corps controlled projects are also available by Corps district in the "Annual Report of the Chief of Engineers on Civil Works Activities." Table 1 of this report is a summary of the data while other tables present detailed information.

The Annual Flood Damage Report shows that both flood damages sustained and damages prevented in Fiscal Year 1986 exceeded all previous records. Preliminary estimates indicate $6.0 billion in flood damages occurred, three times the ten-year (1976-1985) average of $2.0 billion. Estimates of damages sustained and damages prevented are not adjusted for inflation. Flood related fatalities totaled 208 lives.

Weather phenomena such as thunderstorms, hurricanes, tornadoes, tropical storms, major blizzards, and drought caused 194 additional deaths. National economic losses from these phenomena are estimated to be an additional $5.0 billion.

Dams, levees, and other flood control projects operated by the Corps of Engineers prevented $26.2 billion in flood damages. Emergency operations activities prevented another $1.1 billion. This total of $27.3 billion is almost triple the ten-year (1976-1985) average of $9.4 billion. Through Fiscal Year 1986, total flood damages prevented by all Corps flood control projects were $183 billion. Corps projects were particularly effective in California, Oregon, West Virginia, Pennsylvania, Maryland, Kansas, and Missouri. When the worst flood of record struck central California in February 1986, flood control projects and emergency efforts significantly reduced flooding, thus preventing $13.9 billion in damages. Once again, projects protecting the Lower Mississippi River Valley functioned well in preventing over $9.3 billion in damages. The Arkansas River basin flood in October 1986 will be included in Fiscal Year 1987 accounting; however, preliminary estimates indicate that Corps of Engineers projects prevented about $800 million in damages.

From a national perspective, the benefits these projects produced are far in excess of the cost incurred to construct and operate and maintain them. Moreover, these projects produced benefits which were of critical importance to the well being of individual floodplain occupants across the country and to the economic welfare of the region where these projects performed their intended functions.

In spite of the tremendous contributions to flood damage reduction made by these projects, the data indicate that damages resulting from flooding across the Nation continue to increase and many productive projects remain to be constructed. The benefits produced by projects can serve as the basis for a continuing Federal and non-Federal partnership in the construction and operation of future flood control works. The charter for this partnership was given in Public Law 99-662, the Water Resources Development Act of 1986. While under that charter, non-Federal sponsors will have to bear a more substantial share of future project costs, the data in this report illustrate the productive power of sound water resources investment. That productivity provides the basis for non-Federal sponsors to fund their shares of the costs of future projects.

Severe damage potential continues for the Great Salt Lake and the Great Lakes. These lakes are already at record levels for this time of year and could very well exceed all previous record levels this summer when they peak. Damages on the Great Lakes occur as a result of high water and high waves generated by strong winds. Damages in Fiscal Year 1986 were much less than expected because the storms creating high waves were much less in both intensity and frequency than normal. The longer these high water levels persist, the greater the probability that strong winds will occur and cause major damage to shoreline communities.

I am sending an identical letter to the Honorable Tom Bevill, Chairman, Subcommittee on Energy and Water Development, Committee on Appropriations, United States House of Representatives.

Sincerely,

Robert K. Dawson

Robert K. Dawson
Assistant Secretary of the Army
(Civil Works)

Enclosure

## ARMY CORPS OF ENGINEERS
## ANNUAL FLOOD DAMAGE REPORT
## FOR FISCAL YEAR 1986

1. **DAMAGES PREVENTED.** During FY 86, Corps projects and flood fight efforts set a new record by preventing an estimated $27.3 billion in flood damages. Flood control projects, including dams, levees, and local protection projects, prevented $26.2 billion, and emergency operations prevented an additional $1.1 billion. The previous record was set in FY 83 when $23.2 billion in flood damages were prevented. Tables 1-4 summarize the FY 86 flood damages prevented. Through FY 86, the accumulative flood damages prevented by Corps flood control projects were $183 billion. Estimates of damages prevented are not adjusted for inflation. In FY 86, Corps flood control works were highly effective in preventing flood damages in parts of Puerto Rico, West Virginia, Pennsylvania, Maryland, Virginia, Kansas, Missouri, Oregon, and California.

2. **FLOOD DAMAGES PREVENTED BY CORPS PROJECTS AND EMERGENCY RESPONSE ACTIVITIES.** The worst storm of the year occurred in Oregon and California. A large and powerful storm system produced record amounts of precipitation over much of northern California and western Oregon. The result was record high flood stages along many rivers. Heaviest precipitation in California occurred during the ten-day period from February 12-21, 1986, in the areas extending 200 miles north and 100 miles south of Sacramento. The Upper Russian River basin received some of the heaviest precipitation during this storm period. Although flood damages occurred in Guerneville, the city would have received an additional four feet of water had not Warm Springs Dam and Coyote Valley Dam been in place. Extensive flood fight efforts by the Corps prevented over $1.0 billion in damages.

Folsom Dam and Lake on American River prevented a probable disaster when it contained a 700,000 cubic feet per second (cfs) surge caused by the failure of the cofferdam of the unconstructed Auburn Dam Project. Pardee and Camanche reservoirs on the Mokelumne River reduced an estimated natural peak flow at Woodbridge, California, from 34,000 cfs to 4,600 cfs.

The reservoirs and the extensive levee system on the Sacramento River prevented extensive major damages to metropolitan areas of Sacramento, California. The Sacramento River peaked at an all-time record high stage.

New record maximum storage volumes were set at Black Butte Lake on Stoney Creek, Folsom Lake on the American River, and Lake Sonoma on Dry Creek. Lake Sonoma, which was recently completed and in its initial filling phase, was filled almost two years earlier than anticipated.

In the Willamette River basin of Oregon, on February 22 and 23, 1986, heavy rains, in combination with snowmelt due to warm temperatures, caused rivers to rise above flood stage. Regulation of the 13 Willamette Valley reservoirs reduced flood levels as much as 10 feet. Over $1.3 billion in flood damages were prevented.

Flood damages in the order of $308 million were prevented in various locations in the Upper Monongahela River basin in West Virginia, Maryland, and Pennsylvania during the November 1985 storm. The same storm spilled over into the Potomac River basin, where another $113 million in damages were prevented. In May 1986, a major storm hit the Midwest. In Missouri alone, over $450 million in damages were prevented. Projects protecting the Lower Mississippi River Valley worked well in preventing over $9.8 billion in damages. Table 1 summarizes the FY 86 flood damages prevented by region, and Tables 2 and 3 list by state the FY 86 flood damages prevented by projects and emergency operations, respectively. Table 4 is the sum of Tables 2 and 3.

Hurricane Juan brought widespread flood and destruction from October 27 to November 5, 1985. It first touched land on October 29 along the Louisiana coast. Its path crossed Georgia and continued into the Middle Atlantic States, where it caused the worst flooding disaster since Hurricane Agnes in June 1972. Well over 200 Corps employees participated in flood fight activities in Virginia, West Virginia, and Pennsylvania. Corps projects prevented $551.6 million in damages, but the hurricane and the resulting weather systems still caused about $1.0 billion in damages.

Record high water levels persist in the Great Lakes as a result of above-normal precipitation every year for the past ten years. The Corps of Engineers provided $7 million in temporary flood protective works and flood fighting assistance in those areas which were beyond the capabilities of state and local governments. Severe damage potential continues for shoreline communities. The Great Lakes, already at record levels for this time of year, could very well exceed all previous record levels this summer when the lakes annually peak. Damages on the Great Lakes occur as a result of high water and high waves generated by strong winds. Damages in FY 86 were much less than expected because the number of significant storms which create high, damaging waves were fewer than normal. The longer these high water levels persist, the greater the probability that strong winds will occur and cause major damage to shoreline communities. Technical assistance to the states and investigations continue.

3. **FLOOD DAMAGES SUSTAINED**. Total flood damages sustained in FY 86 were over $6 billion, the highest amount of damages incurred since flood recording began. The ten-year average (1976-1985) is $2.0 billion. Damage estimates are not adjusted for inflation.

Significant events occurred in every region of the country, with the exception of the Southwest. An estimated 208 flood related fatalities occurred during FY 86, which is slightly above the annual national average of 200 lives. Flash floods accounted for over 80 percent of the death toll, and at least 60 percent of those deaths took place in moving vehicles.

Eight major flood events occurred in FY 86; these are summarized in Part II of Table 1. In early October 1985, a tropical wave, which later became tropical storm Isabel, moved across Puerto Rico dumping record setting rainfall amounts.

The result was severe flooding, a massive landslide which claimed 180 lives, and damages estimated at over $65 million. Later in October, Hurricane Juan, with its slow meandering course, dumped nearly 20 inches of rain on the Gulf Coast region, which resulted in flooding, compounded by storm surges. Eleven lives were lost, mostly in the coastal and off-shore waters, and flood damages exceeded $1 billion. Rains in central Appalachia began on the first of November as the remnants of Hurricane Juan moved into the area. The rains persisted for six days, resulting in devastating flash floods that claimed 63 lives and left near $1 billion in damages. During February, a series of Pacific storms produced monthly record breaking rainfall that resulted in record to near-record flooding from the Pacific Coast inland to Idaho, Utah, and Nevada. Over 15 lives were lost, and damages were over $450 million. Copious amounts of rainfall during mid-May 1986 produced severe flash flooding in parts of the Missouri bootheel. Losses due to flooding were estimated at $50 million, with only three fatalities. On May 30, torrential rains produced a devastating flash flood in the northern suburbs of Pittsburgh, which resulted in $23 million in estimated flood losses and claimed nine lives. Further west, in Wisconsin, torrential rains on August 6, produced severe flooding in Milwaukee that resulted in an estimated flood loss of $30 million and claimed two lives.

In September 1986, a series of slow-moving storms drenched the Nation's midsection and the Great Lakes region with torrential rains that resulted in record or near-record flooding, which continued into FY 87. Losses through the end of FY 86 are estimated at over $3 billion, with 12 flood-related fatalities and over 6 billion acres of land covered with flood waters. In Oklahoma alone, flood damages to property and crops approach $1 billion. Table 5 summarizes by state the FY 86 flood damages incurred.

4. OTHER MAJOR WEATHER EVENTS. Other events reported include tornadoes, tropical cyclones, droughts, and unusual weather-related phenomena. Part III of Table 1 summarizes losses caused by these events. During the FY 86 tornado season, 700 tornadoes occurred. The results were 19 fatalities, and preliminary property damage estimates place losses at $400 million. The most notable event occurred in the Ohio Valley on March 10, 1986. A line of severe thunderstorms produced 19 tornadoes and numerous downbursts that resulted in over $200 million in damages, 4 deaths, and 173 injuries in Kentucky, Indiana, and Ohio. On May 15, 1986, a short-lived but strong tornado touched down southeast of Coldwater, Michigan, causing damages estimated at $1.6 million. The same cyclone system also produced six tornadoes in southeast Missouri on the same day. These 6 tornadoes caused 1 death, 34 injuries, and over $50 million in damages. Table 6 summarizes by state the FY 86 tornado losses.

Eight named tropical cyclones occurred in FY 86. Three remained tropical storms, and five reached hurricane strength. Hurricane Juan was the most notable hurricane of the season, while Isabel was the most notable tropical storm. Juan moved inland on October 31, 1985, into southeast Alabama after three days of havoc along the Louisiana coast. Hurricane Juan, the deadliest and most damaging hurricane of the fiscal year, claimed 12 lives and caused over $1.5 billion in damages. Tropical storm Isabel was upgraded from a tropical wave on October 7, 1985, after producing record-setting heavy rains, severe flooding, and a massive landslide in Puerto Rico. Damages are estimated at over $65 million and 180 lives were lost. Isabel made landfall along the Florida-Georgia border on October 11, 1985. Hurricane Kate made landfall over the Florida panhandle during November 21-22, 1985, then moved across southern Georgia into the Carolinas. Five lives were lost, and damages were estimated at over $500 million. In June, Hurricane Bonnie struck the Texas-Louisiana border, causing 3 deaths, the evacuation of 22,000 people, and an estimated $11.7 million in damages. On August 11, 1986, an area of low pressure formed in the eastern Gulf of Mexico, then moved into the Florida panhandle, across southern Georgia, and emerged off the South Carolina coast as a tropical depression, eventually becoming Hurricane Charley. On August 17, 1986, Charley passed over the extreme eastern portions of North Carolina and raked the Mid-Atlantic coast before turning out to sea off the New Jersey coast. Charley claimed five lives and left damages estimated at $15 million. During September 10-20, 1986, Hurricane Earl formed but remained far out in the Atlantic Ocean.

On April 13 and 14, 1986, a major spring storm quickly intensified over the Northern Plains and brought blizzard conditions to a large portion of the area. North Dakota received most of the heavy snow, while strong winds were prominent in Nebraska. However, the most devastating combination of wind and snow was felt in South Dakota, where wind gusting up to 90 mph whipped the snow into drifts up to 15-feet high. The storm was the worst blizzard ever recorded in many areas. More than 11 lives were lost, and damages exceeded $6 million. At the beginning of FY 86, rainfall deficiencies continued to be a problem in the Southeast, especially the southern Appalachia region. The beneficial rains of Hurricanes Juan and Kate and tropical storm Isabel provided some short-term relief from this ongoing event but were insufficient to alleviate the drought conditions. A drier than normal spring and summer caused the continuing decline of streams and groundwater levels in the Southeast. Record low flows were reported from the Gulf Coast region into the Middle Atlantic Coastal region. Streamflows were below normal, and most reservoirs were drained to record lows or near-record lows. As a result, over 100,000 acres of land were burned, isolated areas throughout the Southeast imposed water use restrictions (voluntary and involuntary), and the agricultural communities were devastated. These conditions all contributed to well over $3 billion in damages. Corps of Engineers reservoirs provided some relief to this unprecedented drought by meeting some municipal and industrial water supply needs, adjusting hydropower production schedules to optimize both water and power use, and maintaining minimum flows to meet fish and wildlife and other water quality objectives.

### Table 1
### Summary of Fiscal Year 1986
### (In Millions of Dollars)

I. Flood Damages Prevented

| Regions | Damages Prevented |
|---|---|
| New England | .7 |
| Mid-Atlantic | 357.7 |
| Gulf and South Atlantic | 41.8 |
| Ohio | 633.6 |
| Tennessee | .6 |
| Great Lakes | 28.1 |
| Upper Mississippi | 113.8 |
| Souris-Red-Rainy | 19.0 |
| Missouri | 860.5 |
| Arkansas-Red-White | 174.7 |
| Lower Mississippi | 9,336.1 |
| Rio Grande | 87.1 |
| Texas and Gulf | 208.2 |
| Colorado | .0 |
| Great Basin | 16.3 |
| California | 13,910.9 |
| Columbia-North Pacific | 1,521.7 |
| Alaska | 6.8 |
| Hawaii | .2 |
| TOTAL | 27,317.8 |

II. Major Floods and Damages Sustained

| Month | Location | Lives Lost | Damages Sustained |
|---|---|---|---|
| Oct 85 | Puerto Rico | 55 | 65.0 |
| Oct 85 | Gulf Coast | 11 | 1,000.0 |
| Nov 85 | Appalachia | 63 | 1,000.0 |
| Feb 86 | West Coast | 15 | 450.0 |
| May 86 | Missouri | 3 | 50.0 |
| May 86 | Pennsylvania | 9 | 23.0 |
| Aug 86 | Wisconsin | 2 | 30.0 |
| Sep 86 | Middle Am | 12 | 3,000.0 |
| Est Total (All floods in US in FY 86) | | 208 | 6,000.0 |

III. Other Major Weather Events and Damages

| Event | Number | Lives Lost | Damages Sustained |
|---|---|---|---|
| Tropical Cyclones | 8 | 200* | 2,092.0* |
| Major Blizzard | 1 | 11 | |
| Major Drought | 1 | 0 | 3,000.0 |
| Tornadoes | 700 | 19 | 400.0 |
| Est Total (Exclusive of Floods) | | 168* | 4,500.0* |

***NOTE: 62 deaths and $1,065,000,000 were flood related and included in the above table. (Values from National Weather Service)**

## TABLE 2

## FISCAL YEAR 1986
## DISTRIBUTION BY STATE
## FLOOD DAMAGES PREVENTED BY CORPS CONTROLLED PROJECTS
(In Thousands of Dollars)

| STATE | |
|---|---|
| ALABAMA | 0 |
| ALASKA | 6,828 |
| ARIZONA | 0 |
| ARKANSAS | 466,429 |
| CALIFORNIA | 12,810,920 |
| COLORADO | 502 |
| CONNECTICUT | 25 |
| DELAWARE | 0 |
| FLORIDA | 0 |
| GEORGIA | 0 |
| HAWAII | 220 |
| IDAHO | 20,757 |
| ILLINOIS | 66,942 |
| INDIANA | 46,287 |
| IOWA | 106,757 |
| KANSAS | 114,694 |
| KENTUCKY | 16,110 |
| LOUISIANA | 8,478,185 |
| MAINE | 0 |
| MARYLAND | 109,102 |
| MASSACHUSETTS | 437 |
| MICHIGAN | 9,655 |
| MINNESOTA | 22,083 |
| MISSISSIPPI | 360,552 |
| MISSOURI | 717,801 |
| MONTANA | 17,878 |
| NEBRASKA | 72,187 |
| NEVADA | 2,000 |
| NEW HAMPSHIRE | 350 |
| NEW JERSEY | 121 |
| NEW MEXICO | 87,139 |
| NEW YORK | 80,610 |
| NORTH CAROLINA | 4,034 |
| NORTH DAKOTA | 4,324 |
| OHIO | 97,966 |
| OKLAHOMA | 61,857 |
| OREGON | 1,394,551 |
| PENNSYLVANIA | 224,267 |
| PUERTO RICO | 25,000 |
| RHODE ISLAND | 0 |
| SOUTH CAROLINA | 157 |
| SOUTH DAKOTA | 746 |
| TENNESSEE | 10,719 |
| TEXAS | 208,333 |
| UTAH | 2,300 |
| VERMONT | 1,362 |
| VIRGINIA | 87,703 |
| WASHINGTON | 98,808 |
| WEST VIRGINIA | 353,765 |
| WISCONSIN | 12 |
| WYOMING | 9,667 |
| ===== | ========= |
| TOTAL | 26,200,172 |

## TABLE 3

### FISCAL YEAR 1986
### DISTRIBUTION BY STATE
### FLOOD DAMAGES PREVENTED BY CORPS SUPPORTED EMERGENCY OPERATIONS
(In Thousands of Dollars)

| STATE | |
|---|---:|
| ALABAMA | 0 |
| ALASKA | 0 |
| ARIZONA | 0 |
| ARKANSAS | 0 |
| CALIFORNIA | 1,100,000 |
| COLORADO | 0 |
| CONNECTICUT | 0 |
| DELAWARE | 0 |
| FLORIDA | 0 |
| GEORGIA | 0 |
| HAWAII | 0 |
| IDAHO | 0 |
| ILLINOIS | 1,293 |
| INDIANA | 0 |
| IOWA | 121 |
| KANSAS | 0 |
| KENTUCKY | 0 |
| LOUISIANA | 0 |
| MAINE | 0 |
| MARYLAND | 0 |
| MASSACHUSETTS | 0 |
| MICHIGAN | 756 |
| MINNESOTA | 0 |
| MISSISSIPPI | 0 |
| MISSOURI | 125 |
| MONTANA | 1,653 |
| NEBRASKA | 0 |
| NEVADA | 12,000 |
| NEW HAMPSHIRE | 0 |
| NEW JERSEY | 0 |
| NEW MEXICO | 0 |
| NEW YORK | 0 |
| NORTH CAROLINA | 0 |
| NORTH DAKOTA | 0 |
| OHIO | 0 |
| OKLAHOMA | 0 |
| OREGON | 0 |
| PENNSYLVANIA | 0 |
| PUERTO RICO | 0 |
| RHODE ISLAND | 0 |
| SOUTH CAROLINA | 0 |
| SOUTH DAKOTA | 65 |
| TENNESSEE | 0 |
| TEXAS | 0 |
| UTAH | 0 |
| VERMONT | 0 |
| VIRGINIA | 0 |
| WASHINGTON | 0 |
| WEST VIRGINIA | 500 |
| WISCONSIN | 115 |
| WYOMING | 970 |
| TOTAL | 1,117,598 |

## TABLE 4

## FISCAL YEAR 1986
## DISTRIBUTION BY STATE
## TOTAL FLOOD DAMAGES PREVENTED BY CORPS OF ENGINEERS
(In Thousands of Dollars)

| STATE | |
|---|---:|
| ALABAMA | 0 |
| ALASKA | 6,828 |
| ARIZONA | 0 |
| ARKANSAS | 466,429 |
| CALIFORNIA | 13,910,920 |
| COLORADO | 502 |
| CONNECTICUT | 25 |
| DELAWARE | 0 |
| FLORIDA | 0 |
| GEORGIA | 0 |
| HAWAII | 220 |
| IDAHO | 20,757 |
| ILLINOIS | 68,235 |
| INDIANA | 46,287 |
| IOWA | 106,878 |
| KANSAS | 114,694 |
| KENTUCKY | 16,110 |
| LOUISIANA | 8,478,185 |
| MAINE | 0 |
| MARYLAND | 109,102 |
| MASSACHUSETTS | 437 |
| MICHIGAN | 10,411 |
| MINNESOTA | 22,083 |
| MISSISSIPPI | 360,552 |
| MISSOURI | 717,926 |
| MONTANA | 19,531 |
| NEBRASKA | 72,187 |
| NEVADA | 14,000 |
| NEW HAMPSHIRE | 350 |
| NEW JERSEY | 121 |
| NEW MEXICO | 87,139 |
| NEW YORK | 80,610 |
| NORTH CAROLINA | 4,034 |
| NORTH DAKOTA | 4,324 |
| OHIO | 97,966 |
| OKLAHOMA | 61,857 |
| OREGON | 1,394,551 |
| PENNSYLVANIA | 224,267 |
| PUERTO RICO | 25,000 |
| RHODE ISLAND | 0 |
| SOUTH CAROLINA | 157 |
| SOUTH DAKOTA | 811 |
| TENNESSEE | 10,719 |
| TEXAS | 208,333 |
| UTAH | 2,300 |
| VERMONT | 1,362 |
| VIRGINIA | 87,703 |
| WASHINGTON | 98,808 |
| WEST VIRGINIA | 354,265 |
| WISCONSIN | 127 |
| WYOMING | 10,637 |
| TOTAL | 27,317,770 |

## TABLE 5
## FY 86 Flood Damages Incurred

| State | Property ($000) | Acres Inundated (Thousands of Acres) | Lives Lost |
|---|---|---|---|
| Alabama | * | | 0 |
| Alaska | * | | 0 |
| Arizona | 3,000+ | | 0 |
| Arkansas | 2,240+ | 90 | 0 |
| California | 402,000 | 1,800+ | 14 |
| Colorado | 166+ | 1 | 0 |
| Connecticut | * | | 0 |
| Delaware | * | | 0 |
| Florida | 7,275+ | | 0 |
| Georgia | 2,000+ | 236+ | 0 |
| Hawaii | * | | 0 |
| Idaho | 2,005+ | | 0 |
| Illinois | 104,705+ | 75+ | 1 |
| Indiana | 2,500+ | 50+ | 0 |
| Iowa | 45,307+ | 371 | 1 |
| Kansas | 181,700+ | 540+ | 1 |
| Kentucky | 25+ | | 0 |
| Louisiana | 1,515,250+ | | 1 |
| Maine | 5,000+ | | 0 |
| Maryland | * | | 1 |
| Massachusetts | 21,500+ | | 2 |
| Michigan | 405,000+ | 1,500 | 6 |
| Minnesota | 1,501+ | | 2 |
| Mississippi | 651+ | | 0 |

| | | | |
|---|---|---|---|
| Missouri | 155,000+ | 602+ | 7 |
| Montana | 38,674+ | 5+ | 2 |
| Nebraska | 28,482+ | 55+ | 0 |
| Nevada | 20,650+ | 1+ | 1 |
| New Hampshire | 5,962+ | | 0 |
| New Jersey | * | | 0 |
| New Mexico | * | | 2 |
| New York | 30,820+ | | 4 |
| North Carolina | 1,990+ | | 1 |
| North Dakota | 315+ | | 0 |
| Ohio | 10,000+ | 1+ | 1 |
| Oklahoma | 802,250+ | 3,000+ | 2 |
| Oregon | 33,900+ | 1,407+ | 1 |
| Pennsylvania | 71,540+ | 184+ | 11 |
| Rhode Island | * | | 0 |
| South Carolina | 3,070+ | | 3 |
| South Dakota | 6,665+ | 915+ | 0 |
| Tennessee | 15,150+ | | 1 |
| Texas | 34,100+ | 2+ | 25 |
| Utah | 479,000 | 750+ | 1 |
| Vermont | * | | 0 |
| Virginia | 800,000+ | 1,800+ | 22 |
| Washington | 20,351+ | | 0 |
| West Virginia | 600,000+ | 350+ | 38 |
| Wisconsin | 80,000+ | | 2 |
| Wyoming | 250+ | | 0 |
| Puerto Rico | 67,369 | | 55<br>(127 mudslide victims) |

TOTAL:
DEATHS: 208
Monetary Losses: Over $6 billion

* Property damage unavailable but flooding occurred

## TABLE 6

Annual Torndado Losses

| State | Damages Incurred | No. of Tornadoes | Lives Lost |
|---|---|---|---|
| Alabama | 2,515+ | 12 | 2 |
| Alaska | 0 | 0 | 0 |
| Arizona | 0 | 0 | 0 |
| Arkansas | 9,675 | 2+ | 3 |
| California | 1,050 | 7 | 0 |
| Colorado | * | 19+ | 0 |
| Connecticut | 0 | 0 | 0 |
| Delaware | 0 | 0 | 0 |
| Florida | 11,350 | 50 | 1 |
| Georgia | 6,750 | 9 | 0 |
| Hawaii | * | 2 | 0 |
| Idaho | * | 11 | 0 |
| Illinois | * | 19+ | 0 |
| Indiana | 8,155+ | 19 | 2 |
| Iowa | 2,090 | 37+ | 0 |
| Kansas | 1,565+ | 32 | 0 |
| Kentucky | 12,000 | 10 | 0 |
| Louisiana | * | 16 | 0 |
| Maine | * | 2 | 0 |
| Maryland | 0 | 0 | 0 |
| Massachusetts | * | 3 | 0 |
| Michigan | 50,000+ | 36 | 0 |
| Minnesota | 3,200+ | 18+ | 0 |
| Mississippi | 4,500+ | 31 | 0 |
| Missouri | 11,000+ | 14+ | 1 |
| Montana | * | 4 | 0 |
| Nebraska | 12,875 | 54 | 0 |
| Nevada | * | 1 | 0 |

| | | | |
|---|---|---|---|
| New Hampshire | * | 3 | 0 |
| New Jersey | * | 1 | 0 |
| New Mexico | * | 2 | 0 |
| New York (ALB) | * | 8+ | 0 |
| North Carolina | 1,708+ | 18 | 3 |
| North Dakota | * | 29 | 0 |
| Ohio | 1,505+ | 22 | 3 |
| Oklahoma | 69,345 | 45 | 0 |
| Oregon | * | 0 | 0 |
| Pennsylvania | * | 2+ | 0 |
| Rhode Island | * | 3 | 0 |
| South Carolina | * | 2+ | 0 |
| South Dakota | 4,700 | 34 | 0 |
| Tennessee | 1,095+ | 7+ | 0 |
| Texas | 35,785 | 117 | 4 |
| Utah | * | 3 | 0 |
| Vermont | * | 0 | 0 |
| Virginia | * | 2 | 0 |
| Washington | * | 2 | 0 |
| West Virginia | * | 0 | 0 |
| Wisconsin | 1,325 | 14 | 0 |
| Wyoming | 1,005 | 10 | 0 |

TOTAL EVENTS: over 700
DEATHS: 19
Monetary Losses: less than $500 million

* Property damage unavailable

## DETAILED PROJECT SCHEDULES

Senator JOHNSTON. In order that the Committee can carry out its oversight responsibilities, could you provide to the Committee, as soon as possible, the Detailed Project Schedules (PB-2A's) for all the projects included in your Construction, General program for 1988?

Mr. DAWSON. I will provide Detailed Project Schedules (PB-2A's) to the Committee for all projects included in the FY 1988 Construction, General program.

## MULTIPLE YEAR CONSTRUCTION PROGRAM

Senator JOHNSTON. Provide for the record a table showing the funding profile by fiscal year through 1991, followed by the balance to complete, of the construction requirements, both budget authority and outlays, expected for all on-going construction general and MR&T activities 1.) exclusive of the 1985, 1987, and 1988 new starts; 2.) those projects started in the 1985 Supplemental and 1987 continuing Resolution; 3.) the 1988 proposed new starts and 4.) the total of all requirements compared to the newly established obligation ceilings. You should assume a normal funding schedule for all on-going projects funded by Congress in 1987 and that all new starts will go forward to construction.

Mr. DAWSON. I would like to insert, for the record, a table that provides the information you are requesting.

[The information follows:]

MULTIPLE YEAR CONSTRUCTION PROGRAM (FY 1987 - FY 1992)
U.S. ARMY CIVIL WORKS PROGRAM

OBCEILS2
26-Feb-87

FUNDING SCHEDULE AND OBLIGATION CEILINGS

| Programs and Activities | Multiple Year Estimates | | | | | | |
|---|---|---|---|---|---|---|---|
| | FY 1987 | FY 1988 | FY 1989 | FY 1990 | FY 1991 | FY 1992 | SCHED BAL |
| | | | | | | | [1] |
| CONSTRUCTION PROGRAM (Fed.Approp.(BA)) | | | | | | | |
| 1.Construction, General Account | | | | | | | |
| Ongoing Base Program(Excl 85&87 NS) | 956,572 | 732,383 | 646,326 | 419,032 | 427,701 | 259,026 | 460,079 |
| FY 1985/1987 New Starts [2] | 237,410 | 494,777 | 590,486 | 535,659 | 476,043 | 152,015 | 355,975 |
| FY 1988 New Start Programs | | | | | | | |
| Proj. Constr. | | 28,440 | 71,170 | 77,300 | 41,510 | 34,708 | 32,116 |
| Other Programs & New Work [3] | | 63,605 | 69,680 | 124,000 | 82,000 | 205,000 | N/A |
| Subtotal, FY 1988 New Starts | | 92,045 | 140,850 | 201,300 | 123,510 | 239,708 | |
| Savings & Slippage | (41,832) | (131,205) | (62,662) | (45,991) | (42,254) | (20,749) | |
| FY 1987-1992 Program(Net Fed.Approp) | 1,152,150 | 1,188,000 | 1,315,000 | 1,110,000 | 985,000 | 630,000 | |
| 2.M R & T Construction Component | | | | | | | |
| Ongoing Base Program(Excl 85&87 NS) | 204,481 | 198,800 | 201,210 | 212,478 | 223,600 | 229,200 | 2,857,474 |
| FY 1985/1987 New Starts | 1,743 | 8,450 | 10,414 | 7,791 | 7,157 | 4,260 | 10,631 |
| FY 1988 New Starts | | 0 | 0 | 0 | 0 | 0 | 0 |
| Savings & Slippage | (13,627) | (13,005) | (1,400) | (20,500) | (23,000) | (23,000) | |
| Total (Net Fed.Approp) | 192,597 | 194,245 | 210,224 | 199,769 | 207,757 | 210,460 | |
| 3.Total Construction Program (CG & MR&T) | | | | | | | |
| Ongoing Base Program(Excl 85&87 NS) | 1,161,053 | 931,183 | 847,536 | 631,510 | 651,301 | 488,226 | 3,317,553 |
| FY 1985/1987 New Starts | 239,153 | 503,227 | 600,900 | 543,450 | 483,200 | 156,275 | 366,606 |
| FY 1988 New Starts | 0 | 92,045 | 140,850 | 201,300 | 123,510 | 239,708 | 32,116 |
| Savings & Slippage | (55,459) | (144,210) | (64,062) | (66,491) | (65,254) | (43,749) | |
| Total Budget Auth. (Net Fed.Approp) | 1,344,747 | 1,382,245 | 1,525,224 | 1,309,769 | 1,192,757 | 840,460 | |
| CONSTRUCTION PROGRAM (Budget Outlay(BO)) | [4] | | | | | | |
| 1.Construction, General Account | 1,162,000 | 1,198,000 | 1,315,000 | 1,110,000 | 985,000 | 630,000 | |
| 2.M R & T Construction Component | 192,000 | 194,000 | 210,000 | 200,000 | 208,000 | 210,000 | |
| 3.Total Construction Program (CG & MR&T) | 1,354,000 | 1,382,000 | 1,525,000 | 1,310,000 | 1,193,000 | 840,000 | |
| OBLIGATION CEILINGS (PL 99-662) | 1,400,000 | 1,500,000 | 1,600,000 | 1,700,000 | 1,800,000 | N/A | N/A |

[1] Reflects funding for specifically authorized projects only.
[2] Includes funds from the Inland Waterways Trust Fund.
[3] Reflects addition to program for: (a) the recovery of S&S applied to projects in previous years; (b) projects, separable elements, or project features currently scheduled as the next phase of work; and (c) allowances for the dam safety and resumption programs.
[4] Generally assumes that the unobligated carryover remains constant.

## QUESTIONS SUBMITTED BY SENATOR HATFIELD

### DREDGING

Senator HATFIELD. General Heiberg, 2 years ago the Committee was apprised that "private industry has responded well to the national dredging requirements....Accordingly, we are now down to a minimum fleet of level of 4 hopper dredges and 8 nonhopper dredges."First, let me check on the status of the minimum fleet concept. What is the size?

General HEIBERG. We are still operating the same number of minimum fleet dredges as when I last addressed this subject; namely 4 hopper dredges, 3 sidecasters, 3 dustpan dredges, a cutterhead dredge and one small special purpose dredge, for a total of twelve.

Senator HATFIELD. How is your reserve fleet program, mobilizing certain industry dredges in time of emergency, working?

General HEIBERG. We feel quite comfortable with the Corps of Engineers Reserve Fleet as a viable augmentation scheme to meet requirements beyond those we can meet with our minimum fleet. As you know we actually called up the CERF during a mobilization exercise in 1985 with notable success. Since that time our contracting officer in the New Orleans District has kept the CERF dredges signed up with reasonable prices. In fact, we were recently audited by the Army Audit Agency regarding the CERF and they found the contracting and pricing procedures quite acceptable.

Senator HATFIELD. Have you had further limited tests since 1985?

General HEIBERG. No we have had no further tests of the CERF. It takes a range of conditions being present to test the CERF effectively and assure needed dredging is accomplished in a sensible location as it relates to the exercise scenario. We intend to test it in the future when conditions provide for doing so.

Senator HATFIELD. As you know, I have been a strong advocate for many years of the proposition that we must maintain an adequate Corps dredge capability as much for cost reasons as for rapid response to national security or emergency.In the Pacific Northwest, we are maintaining the Corps hopper dredge capability. Do your plans call for retaining the ESSAYONS II and the YAQUINA?

General HEIBERG. Except for rare deployments to say the Hawaiian Islands or Alaska, we plan to retain both dredges in their present center of operations in the Portland District.

Senator HATFIELD. What is your experience in the Pacific Northwest, and other parts of the country with contractor hopper bids compared to the government estimates?

General HEIBERG. I have provided, for the record, a list of all hopper dredging work advertised in FY 86 which shows the project, government estimates, the low bids and the percent low bid of the government estimate. I would like to highlight that the aggregate of the low bids was only 57 percent of the aggregate of the government estimates. This compares to an FY 86 ratio of 76 percent. I believe these figures indicate that we are continuing to get good prices on the hopper dredge work we are doing by contract.

Senator HATFIELD. I understand that there is now underway a massive federal probe focused on bid-rigging in harbor dredging primarily in the Southeast and the Gulf Coast regions. One government official is recently quoted in a Virginia paper as saying, "There is a growing suspicion in Washington that portions of the entire American dredge industry may be tainted." Can you comment on the extent of the problem?

General HEIBERG. I will be happy to relay what I know of the current investigation and a little of the background as well. The Justice Department began a thorough investigation of the dredging industry for possible antitrust violations early in 1983. The Justice Department felt the same conditions might exist in the dredging industry as existed in the highway construction and revetment construction industries where they had earlier found a number of antitrust violations. Both industries had relatively stable workloads and a relatively small number of contractors on a regional basis. Because of this, the Justice Department looked into bid rigging and other forms of collusion that might be used to divide up dredging work. The investigation, which is still underway, is divided into five regions, Gulf Coast, South Atlantic, North Atlantic, Great Lakes and West Coast. To date, 9 companies have been suspended or debarred from bidding on Federal dredging contracts by the Judge Advocate General, the debarment authority. Of the 9 firms suspended, two are large international firms. The others are smaller firms, operating in specific regions of the country. In addition to company suspensions, a number of individuals involved in the operation or management of these companies have also been suspended by the Judge Advocate General as a result of their direct involvement in the antitrust violations.

Senator HATFIELD. In 1984, Mr. Gianelli (Mr. Dawson's predecessor) expressed concern that we may be creating a situation, because we don't have adequate Corps capability, that the bids of private industry may become excessively large. Are you concerned that we may have created or exacerbated this current bid problem due to the virtual elimination of Corps capability in some regions?

General HEIBERG. I am not absolutely sure, but I believe that Mr. Gianelli made such a statement in response to concerns on the part of the Congress with retiring the remaining Corps hopper dredges on the Great Lakes. In that context, Mr. Gianelli indicated that we were holding two of the Corps hopper dredges in a standby status in the event the industry either failed to respond to the dredging being advertised or did so at unreasonable prices. In fact, we did not observe either of these conditions occur. The industry not only responded but built a specially designed small hopper dredge to do the work. We have not observed any price swings and feel comfortable with the situation that now exists. We have found these concerns surface in each of the regions where we reduced or eliminated the Corps capability, but I am not aware of any trends which would indicate that we have created bid problems by reducing to the Corps minimum dredge fleet level. In closing on this question, let me add that our dredges are expressly retained to meet national defense and emergency requirements and as such they are not necessarily intended as some price fixing mechanism. After all, dredging is fairly unique in our construction activities since we have retained a larger in-house capability in this area than any of our other construction activities.

WRSC HOPPER SUMMARY FY86

| PROJECT | STA | CU YD MAINT | LOW BID | GOVERNMENT ESTIMATE | NO. BIDS | % |
|---|---|---|---|---|---|---|
| HUMBOLDT HBR & BAY | CA | 700,000 | $400,000 | $850,200 | 4 | 47% |
| J.F. BALDWIN, PHASE II/3 | CA | 370,000 | $697,700 | $890,770 | 4 | 78% |
| NAVAL AIR STAT ALAMEDA | CA | 275,000 | $714,000 | $872,750 | 4 | 82% |
| SAN PABLO & MARE ISLAND | CA | 800,000 | $1,038,000 | $1,088,000 | 4 | 95% |
| DUVAL CITY | FL | 330,000 | $2,372,500 | $3,148,900 | 2 | 75% |
| FERNANDINA HBR | FL | 170,000 | $315,378 | $837,000 | 4 | 38% |
| JACKSONVILLE HBR | FL | 996,000 | $3,280,000 | $4,955,369 | 5 | 66% |
| BRUNSWICK HBR #1 | GA | 298,450 | $736,435 | $1,428,131 | 4 | 52% |
| BRUNSWICK HBR #2 | GA | 1,269,100 | $1,332,555 | $2,399,901 | 4 | 56% |
| CALCASIEU RIVER BAR CHNL | LA | 5,000,000 | $932,400 | $1,592,040 | 3 | 59% |
| MISSISSIPPI RIVER | LA | 3,000,000 | $1,609,200 | $3,067,720 | 4 | 52% |
| DETROIT RIVER | MI | 207,200 | $1,229,824 | $1,284,710 | 3 | 96% |
| MONROE HBR | MI | 198,500 | $976,775 | $1,014,601 | 3 | 96% |
| SAGINAW RIVER | MI | 291,500 | $847,000 | $1,615,063 | 4 | 52% |
| MANTEO BAY OCEAN BAR | NC | 225,000 | $417,250 | $1,002,750 | 2 | 42% |
| MANTEO SHALLOWBAG | NC | 350,000 | $444,500 | $888,525 | 3 | 50% |
| MOREHEAD CITY HBR #1 | NC | 400,000 | $468,220 | $1,040,706 | 3 | 45% |
| MOREHEAD CITY HBR #2 | NC | 2,600,000 | $3,750,000 | $5,436,000 | 7 | 69% |
| NAVY WEAPON SYSTEMS-EARLE | NJ | 508,184 | $1,138,332 | $2,012,408 | 5 | 57% |
| HUDSON RIVER | NY | 500,000 | $2,538,750 | $2,976,534 | 3 | 85% |
| NEW YORK(RED HOOKS FLATS) | NY | 218,000 | $883,400 | $863,768 | 3 | 102% |
| ROCHESTER HBR | NY | 300,000 | $1,090,000 | $1,461,083 | 5 | 75% |
| CONNEAUT HBR | OH | 85,000 | $246,600 | $295,655 | 1 | 83% |
| SANDUSKY HBR | OH | 175,000 | $547,000 | $646,236 | 3 | 85% |
| TOLEDO HBR #1 | OH | 850,000 | $1,488,500 | $2,888,671 | 4 | 52% |
| TOLEDO HBR #2 | OH | 300,000 | $865,000 | $1,038,432 | 3 | 83% |
| COOS BAY & MOUTH COLUMBIA | OR | 5,000,000 | $3,000,000 | $8,530,000 | 4 | 35% |
| YAQUINA BAY & HBR | OR | 225,000 | $222,000 | $258,250 | 3 | 86% |
| ERIE HBR | PA | 75,000 | $245,000 | $313,465 | 5 | 78% |
| PORT ROYAL HBR | SC | 500,000 | $646,440 | $1,021,040 | 2 | 63% |
| FREEPORT BAR & JETTY | TX | 630,000 | $391,000 | $1,025,900 | 3 | 38% |
| GALVESTON ENT CHNL | TX | 2,591,000 | $1,435,050 | $4,553,790 | 3 | 32% |
| PORT MANSFIELD | TX | 545,000 | $523,000 | $988,380 | 3 | 53% |
| SABINE-NECHES | TX | 5,412,000 | $1,628,768 | $6,408,800 | 3 | 25% |
| MILWAUKEE HBR | WI | 325,000 | $1,994,470 | $2,277,010 | 4 | 88% |
| TOTAL | | 35,719,934 | $40,445,047 | $70,972,558 | 124 | 57% |

% PERCENT LOW BID OF GOVERNMENT ESTIMATE

Senator HATFIELD. There is concern over your reinstatement of some convicted companies as eligible bidders. Why have you reinstated these firms? What procedures and protections are followed in their reinstatement?

General HEIBERG. The purpose of suspension and debarment, which makes bidders ineligible to receive Government contracts, is to protect the Government from having to do business with contractors who are not responsible. Suspension and debarment, however, are not used as punishment.

Within the Army, the Judge Advocate General's Office is the debarment authority. The Army Supplement to the Federal Acquisition Regulation describes the process by which the decision is made to suspend or debar contractors. That process basically calls for notification to the contractor of the proposed suspension or debarment. It allows the contractor to provide matters in mitigation, extenuation or defense. It also affords the contractor the opportunity for a hearing if a dispute of fact arises. In the case of the dredging debarments, all contractors who requested a hearing were allowed to present their case to the Assistant Judge Advocate General for Military Law, the Debarment Authority. The decision as to debarment, suspension or settlement with the dredgers was made by the Debarment Authority, after coordination with the Corps. For those dredgers who were convicted of felonies, the Secretary of the Army personally approved all settlement agreements proposed by the debarment authority which call for debarment of less than one year.

A contractor who is not presently responsible can make himself responsible by taking corrective action. In the case of the dredging industry, this is what occurred. Individuals who took part in the illegal activities were either removed from any connection with Government contracting or were fired outright. Restitution to the Government for all damages is being made. Internal controls, e.g. audits, review of bids by the chief executive officers, and educational programs to ensure all employees involved know what conduct is illegal, have been instituted. External controls, e.g., the establishment of an ombudsman to ensure compliance with the antitrust laws, have also been established. The requirement for these controls has been formalized as part of the settlement agreement with the Debarment Authority which reinstates contractors to eligibility for award of Government contracts. Actions which correct the wrongs and take steps to preclude reoccurence are those of a contractor who is now responsible. Any breach of the settlement agreement, which is closely monitored by the Debarment Authority and the Corps, can result in immediate debarment.

## QUESTIONS SUBMITTED BY SENATOR MCCLURE

### CLEARWATER FISH HATCHERY

The timely construction of the Clearwater Anadromous Fish Hatchery in Northern Idaho is urgently needed to augment the anadromous fish runs in the Clearwater River and its tributaries. The future of the spring Chinook runs in these waters is of major concern. The construction would also offer considerable economic assistance to the depressed economy of the Clearwater Basin. In addition, the City of Orofino, Idaho, has developed plans to draw from the fish hatchery pipeline for the City's water supply.

Question. What is the status of the Clearwater Fish Hatchery and the water supply for the hatchery?

Answer. The Clearwater Fish Hatchery is under design. The Corps has completed a report which presents alternatives for supplying water to the hatchery. That report is under review in my office.

Question. When do you expect a decision on the hatchery water supply?

Answer. I will make my decision by late March.

Question. If the water supply is resolved, when could hatchery construction begin?

Answer. A start of hatchery construction has not been scheduled.

Question. Do you have adequate funds budgeted for Fiscal Year 1988 to start construction?

Answer. No funds have been budgeted for construction of the Clearwater hatchery in Fiscal Year 1988.

Question. What are your first year funding requirements for the Clearwater Hatchery?

Answer. First year funding requirements are estimated to be $3 million.

Question. If the hatchery water supply is from Dworshak Reservoir, will you allow the city of Orofino to also get water from the system?

Answer. That is under consideration, subject to a cost sharing agreement with the City of Orofino.

## QUESTIONS SUBMITTED BY SENATOR SPECTER

### HARRISBURG

Question. What is the status of the Harrisburg local protection project in Pennsylvania?

Answer. This project is budgeted in FY 88 for $965,000, for Preconstruction Engineering and Design. This effort is scheduled for completion in June 1990.

### LOCK HAVEN

Question. What is the status of the Lock Haven local protection project in Pennsylvania?

Answer. This project is budgeted in FY 88 for $1,049,000, to complete Preconstruction Engineering and Design.

### WYOMING VALLEY

Question. What is the status of the Wyoming Valley (Levee Raising) project in Pennsylvania?

Answer. The project is budgeted in FY 88 for $1,800,000 for Preconstruction Engineering and Design. The effort is scheduled for completion in March 1991.

### MILTON

Question. What is the status of the Milton local protection project in Pennsylvania?

Answer. A study completed in May 1977 showed that providing protection to Milton was not economically justified. The BCR was 0.66 to 1, using 1975 price levels. No funds are budgeted for this study in FY 88.

### SCHUYLKLL RIVER

Question. What is the status of the Schuylkyll River project?

Answer. A study, which was suspended in 1978, determined that flood control improvements for Pottstown were not economically justified. Subsequently, these findings were reviewed, and in April 1983, Congress was informed that the earlier determination was still valid. No funds are budgeted in FY 88 for further work on this project.

### SUNBURY CLOSURE STRUCTURE

Question. What is the status of the Sunbury Closure Structure project in Pennsylvania?

Answer. The work involves permanently closing a gap in the line of protection at Sunbury, where a rail line crosses the Susquehanna River. This rail line has been abandoned, and the opening is now closed temporarily by the local sponsor, as needed. The Federal share of the estimate cost of the permanent closure is estimated to be $56,000. No funds are budgeted for this work, and the local sponsor has not indicated a willingness to cost share this work.

### CURWENSVILLE LAKE WATER LINE

Question. What is the status of the Curwensville Lake Water Line project in Pennsylvania?

Answer. This project, which involves the construction of a water line to serve a local community, is not budgeted in FY 88 as this work is a local responsibility.

### MARSH CREEK BRIDGE

Question. What is the status of the Marsh Creek Bridge Repair project in Pennsylvania?

Answer. This bridge was apparently damaged by high flows caused by the release of water from Foster Joseph Sayers Dam. Section 1159 of the WRDA of 1986 specifies that the work must be cost shared, with the non-Federal share being 50 percent. At this time, the ownership of the bridge and the identity of the non-Federal sponsor are unknown. Consequently, no funds are budgeted in FY 88 for this work. The estimated Federal cost of the repairs is $25,000.

### PRESQUE ISLE

Question. What is the status of the Presque Isle project in Pennsylvania?

Answer. The FY 88 budget includes $1,250,000 for ongoing periodic nourishment at this project. No funds are budgeted for construction of offshore breakwaters as this work is under review by the Assistant Secretary of the Army (Civil Works).

### OHIO RIVER, LOCK AND DAM 7

Question. What is the status of the Lock and Dam Seven Replacement project in Pennsylvania?

Answer. The Lock and Dam Seven (Gray's Landing) project on the Monongahela River is budgeted for $3,300,000 in FY 88 for engineering and design and land acquisition. The total cost of the replacement is estimated to be $124,790,000.

### OHIO RIVER, LOCK AND DAM 8

Question. What is the status of the Lock and Dam Eight Replacement project in Pennsylvania?

Answer. The Lock and Dam Eight (Point Marion) project on the Monongahela River is budgeted for $1,100,000 in FY 88 for engineering and design. The total cost of the replacement is estimated to be $89,200,000.

### SAW MILL RUN

Question. What is the current status of the Saw Mill Run local protection project in Pennsylvania?

Answer. No funds are budgeted in FY 88 for this project, as local interests have not, in the past, expressed interest in going forward with the work.

### BEAVER RIVER

Question. What is the status of the Beaver River Planning, Engineering and Design project in Pennsylvania?

Answer. No funds are budgeted in FY 88 for this work. Since the benefits of the project are primarily recreational, further work on this project is not in agreement with present budget policy.

### SCRANTON

Question. What is the status of the small project proposals studied by the Army Corps of Engineers in Scranton, Pennsylvania?

Answer. Five areas in Scranton were studied as potential small projects. In all five cases, flood control improvements were found to be economically infeasible.

## QUESTIONS SUBMITTED BY SENATOR CHILES

### CLEARWATER SPOIL DISPOSAL, FLORIDA

Question. Congress last year appropriated $77,000 for continuation of the Clearwater Spoil Disposal feasibility study in Pinellas County. But recent correspondence from the Jacksonville District Engineer indicates that this study had been terminated. What is the current status of the Clearwater Disposal Study, and what action is the Corps taking to continue the study as requested by the Congress?

Answer. The reconnaissance phase of the study is complete and no further effort is warranted. The study has been terminated due to the lack of any economic justification for navigation improvements in the Clearwater area at this time. Therefore, the Corps is taking no further action to continue this study.

### MANATEE COUNTY BEACH EROSION, FLORIDA

Question. Hurricane Elena caused severe erosion along Anna Maria Island in Manatee County late in 1985. The threat to property and to a coastal road which provides the only evacuation route from the Island led the County and State to request an update of the General Design Memorandum for the Manatee County Beach Erosion Control Project, hoping to initiate construction as soon as possible. The County offered to pay for the design update, so that work could begin quickly.

This request was originally denied because of the recreational benefits the project would also provide. I understand, however, that a review of the project is being made. Does the Corps now expect to accept the request of the local sponsor, or ask for Federal funds to update the General Design Memorandum.

Answer. The review of project benefits has been favorably completed and the Corps can now proceed to complete planning and engineering, including the final General Design Memorandum. The project will be considered in the preparation of the Fiscal Year 1989 budget.

### TAMPA BAY, HURRICANE EVACUATION, FLORIDA

Question. Last year the Congress appropriated $100,000 to conduct a comprehensive hurricane evacuation study of the Tampa Bay area. The results of the study will be applicable to other densely populated coastal areas in Florida and other states. There is a clear need for such a study, given the limited warning time which can be provided coastal residents by the National Weather Service. This was clearly demonstrated during Hurricane Elena in 1985, when the storm veered unexpectedly toward the Tampa Bay area causing severe flooding and massive evacuation difficulties.

Could you please report on the progress being made by the Corps in carrying out this comprehensive study?

Answer. The reconnaissance phase of the study is complete and no further effort is warranted. The study lacks local support. Study findings to date will be made available for use by state and local entities.

## RECREATIONAL PROJECTS

Question. Tourism is the most important industry in the State of Florida, with over 260 million visits being made to Florida's beaches each year. The States recreational and environmental resources are valuable and rewarding assets. Florida's efforts to preserve and enhance those resources provide that the state will be able to support its current and expected population and assures the health of its most vital industry, tourism.

Many projects carried out be the Corps through the years have been considered to have recreational benefits in excess of 50% of total benefits. But there has been a real and indentifiable economic benefit from those projects.

I therefore have grave concerns regarding a new policy initiative by the Administration which I understand would recommend no federal funding for any project if recreational benefits exceed 50% of the total indentifiable benefits. I am also unceratin whether this policy has been reviewed in light of the policy guidelines and cost-sharing provisions in the Omnibus Water Resources Development Act of 1986. I would like a clear definition of this policy and would like to know if the policy has been modified subsequent to passage of H.R. 6. And I would like to emphasize to the Corps the importance of so-called recreational projects to Florida's environmental and economic interests.

Answer. The fact that there is a cost sharing policy established for a particular project output does not necessarily mean that the Administration is willing to budget for project producing primarily that output. When recreation is included in a multi-purpose project, the development will be cost shared on a 50/50 basis. That does not mean, however, that the Administration is willing to budget for studies or projects in separable elements of projects which have recreation as their primary project output. In our view, recreation is like municipal and industrial water supply. It should be the responsibility of the non-Federal sector, whether that sector is private or governmental, particularly in this time of budget austerity. We feel we must limit the use of our available funds to flood control and commerical navigation, which have historically been, and continue to be, the central focus of the Army Corps of Engineers Civil Works program. This was our policy prior passage of P.L. 99-662 and the new authorization Act does not alter our budgetary priorities.

## QUESTIONS SUBMITTED BY SENATOR SARBANES

### CHESAPEAKE BAY

QUESTION. My colleagues in the Bay community and I greatly appreciate the leadership and commitment which you and Secretary Marsh have demonstrated in ensuring that the Army Corps of Engineers remains a full partner in the Chesapeake Bay restoration effort. We were particularly pleased by the Army's agreement to provide funding of approximately $1.5 million for the development of the three - dimensional water quality model of the Bay. What is current status of the model?

ANSWER. A Memorandum of Understanding (MOU) with the U. S. Environmental Protection Agency has been drafted. The MOU would establish the cooperation of the Department of the Army and the U.S. Environmental Protection Agency in the development and application of the three - dimensional time - variable hydrodynamic/water quality model.

QUESTION. The Fiscal Year 1986 and 1987 appropriations bill provided funds of approximately $700,000 for the Corps of Engineers' Chesapeake Bay Shore Erosion Study and Water Resources Act provided the authorization for funding of this study. It is my understanding that the reconnaissance phase of this study was completed in March, 1986 and that the State of Maryland and the Commonwealth of Virginia have completed negotiating cost-sharing agreements with the Corps of Engineers to implement the recommendations of the reconnaissance phase of the Study. What are the Corps of Engineers' plans and schedule for implementing the findings of that study? At Senator Mathias' hearing on the Chesapeake Bay last June, I expressed concerns that the shoreline erosion study be completed in a timely manner. Is nearly a year the normal review time at the Washington level of this phase of the study?

ANSWER. It was recognized early in the review process that the benefit outputs (recreation, loss of land) for the subject study were low in the Corps of Engineers' funding priority. We are still expending considerable effort between Corps offices to sharpen the focus of the reconnaissance report to determine if there were areas of high priority outputs that should be further studied. This has extended the review time at the Washington level beyond that which would be normal for a typical flood control study.

QUESTION. The Committee has provided funding for the Corps of Engineers to study all major tributaries entering the Bay for their potential impact on the Bay during periods of low flows. I understand that a limited-scope reconnaissance phase report has been concluded and that the report recommends a more detailed review of fresh water resource use across the Bay basin. What are the Corps of Engineers' plans and schedule for completing this review?

ANSWER. The limited reconnaissance report for the Chesapeake Bay and Tributaries Reallocation Study is currently being staffed through HQUSACE to be certified for compliance with current policies. Upon certification, funds will be provided in FY 87 to initiate the reconnaissance phase of the study.

## SOUTH ATLANTIC DIVISION

## STATEMENT OF BRIG. GEN. C. ERNEST EDGAR III, DIVISION ENGINEER

ACCOMPANIED BY:

WILLIAM R. DAWSON, CHIEF, PROGRAM DEVELOPMENT OFFICE
WILLIAM H. OSBORNE, ASSISTANT CHIEF, PROGRAM DEVELOPMENT OFFICE

### BIOGRAPHICAL SKETCH

Senator JOHNSTON. We are pleased to welcome General Edgar of the South Atlantic Division.

I have your biographical sketch which I would like to include in the record.

General EDGAR. All right, sir.

[The biography follows:]

### BIOGRAPHY OF BRIG. GEN. C. ERNEST EDGAR III, COMMANDER AND DIVISION ENGINEER, U.S. ARMY ENGINEER DIVISION, SOUTH ATLANTIC

Brigadier General C. Ernest Edgar III has been Commander and Division Engineer of the U.S. Army Corps of Engineers' South Atlantic Division since September 3, 1985. In this assignment he is responsible for a military and civil works planning, design and construction program that extends halfway around the world, including eight Southeastern states, Puerto Rico, the U.S. Virgin Islands, Latin America, the Middle East and Africa. He manages a total work force of 5,500 military and civilian professionals and an annual budget of over $900 million. This includes all Army and Air Force construction in this region, as well as the Corps of Engineers' water resources development program in the Southeast. He also serves as a member of the U.S. Army Engineer Board of Rivers and Harbors, and is a Presidential nominee as a member of the Mississippi River Commission.

Prior to his current assignment, General Edgar was Acting Director of Civil Works in the Corps of Engineers' headquarters in Washington, D.C. Before that, he was Deputy Director of Civil Works, which includes his being President of the U.S. Army Coastal Engineering Research Board and a member of the United States Delegation to the London Dumping Convention, the United Nations Organization which oversees disposal of materials at sea.

A 1958 distinguished military graduate of the Virginia Military Institute where he received a bachelor of science degree in civil engineering, he also holds a master's degree in civil engineering from Iowa State University of Science and Technology. He has attended Harvard University's Advanced Management Program for Senior Executive Fellows, is a graduate of the U.S. Army Command and General Staff College and graduated with distinction from the U.S. Naval War College. General Edgar is a registered professional engineer in Kentucky and Alabama; a member of Tau Beta Pi, the National Engineering Honor Society; the American Society of Civil Engineers; the Society of American Military Engineers; and the author of a number of technical papers and articles.

General Edgar's other recent command assignments include Commander and Division Engineer of the Corps' New England Division; Commandant of Cadets and Professor of Military Science, Virginia Military Institute; Commander and District Engineer, Little Rock District; Commander of the 577th Engineer Battalion (Construction), Vietnam; Company Commander, 237th Engineer Battalion (Combat), Germany, among others.

Staff assignments have included service as Executive Officer, U.S. Army Engineer School, Fort Belvoir; Executive and Assistant Director of Civil Works, Office of the Chief of Engineers in Washington, D.C.; and Staff Officer in the Office of the Deputy Chief of Staff for Military Operations and the Office of Personnel Operations, Department of the Army, Washington, D.C.

Among his military decorations are the Legion of Merit (three awards), the Bronze Star Medal, the Meritorious Service Medal, the Army Commendation Medal (two awards) and the Air Medal.

General Edgar is a native of Mobile, Alabama. He is married to the former Mary Elizabeth Brown also of Mobile. They have three children: Ernest, Elizabeth and William.

Senator JOHNSTON. You may proceed as you wish.

### INTRODUCTION OF ASSOCIATES

General EDGAR. Thank you, very much, Mr. Chairman. I am pleased to be before you again. Assisting me are Mr. William R. Dawson and Mr. William H. Osborne of our Program Development Office. I will present a brief status report on the South Atlantic Division civil works program, fiscal year 1988, followed by a summary of the drought conditions in our area last year.

### DIVISION AREA

The civil works area of the South Atlantic Division encompasses all or part of seven Southeastern states, Puerto Rico, and the U.S. Virgin Islands. The headquarters is located in Atlanta, with district offices located in Wilmington, Charleston, Savannah, Jacksonville, and Mobile. In addition, we have added a sixth district-level organization in Winchester, Va., the Middle East/Africa project office. This office has no civil works within its boundaries.

### BUDGET YEAR PROGRAM

The fiscal year 1988 budget request for the major appropriations is $414,123,000, including $11 million to be derived from the inland waterways trust fund. I will highlight some of our progress and planned activities.

### GENERAL INVESTIGATIONS

We are requesting $10,210,000 for the general investigations program. This allows for the initiation and completion of one reconnaissance and two project review studies. We will continue efforts on an additional 18 feasibility studies of which 5 will be completed during the year. Preconstruction engineering and design work will be initiated on one study and continued on six studies. We will complete one study.

### CENTRAL AND SOUTHERN FLORIDA, HILLSBORO CANAL

The Hillsboro Canal, the new reconnaissance study, is a major outlet for the central and southern Florida flood control project in the Palm Beach and Broward Counties, Fla., area. The current canal provides flood control to the lower reaches of the project and significant water regulation capability to conservation areas in Florida. This study will evaluate the feasibility of modifying the canal to provide increased flood protection and water supply to improve the overall operation of the central and southern Florida project.

### BRUNSWICK HARBOR, GA.

Brunswick Harbor, representative of our navigation studies, is a deep draft port on the Georgia coast about 75 miles south of Savannah. The study is evaluating the feasibility of deepening the 30-foot channels to 36 feet. The Water Resources Development Act of 1986 authorized the inclusion of the locally constructed Colonels Island channel as part of the existing federal project. Requested funds will allow completion of the study.

### VALLEY CREEK, WARRIOR RIVER AND TRIBUTARIES, ALABAMA

The Valley Creek drainage area in north central Alabama is subject to frequent flooding causing damage to residential and public facilities. The study to identify improvements required to reduce flooding is scheduled for completion in January 1989.

### NEUSE RIVER, N.C.

The Neuse River drains about 5,700 square miles of eastern North Carolina. Flood damages occur annually throughout the basin. The study, which will investigate all water resource needs, is about 60 percent complete. Completion is scheduled in July 1989.

### SAN JUAN HARBOR, PUERTO RICO

In preconstruction engineering and design, work will be initiated on the San Juan Harbor, Puerto Rico project. The harbor, located on the north side of the island, is the largest port in Puerto Rico and is essential to the island's economy. The proposed improvements to the existing harbor include enlarged channels with channel extensions and wideners to support deep draft navigation requirements.

### RIO PUERTO NUEVO, PUERTO RICO

The Rio Puerto Nuevo flows through metropolitan San Juan, Puerto Rico. Preconstruction engineering and design effort is underway to provide a channel improvement project for a portion of the river and five tributary streams to reduce flood damages to homes, transportation facilities and numerous public buildings and facilities. The proposed improvement will include channel enlargement, concrete lining and flood control structures.

## CONSTRUCTION PROGRAM

The construction request is $185,111,000, including $11 million to be derived from the inland waterways trust fund. The requested funds will allow construction to be initiated on 3 projects and continued on 22 projects, of which scheduled work will be completed on 2 projects. Sponsors have agreed to cooperate on all new starts.

### CHARLESTON HARBOR, S.C.

The Charleston Harbor, S.C., project provides for deepening the existing 35-foot channel to 42 feet in the entrance channel and 40 feet in the inland channels. The improvement will allow for transportation cost savings by use of larger vessels and more efficient use of the existing fleet.

### MANATEE HARBOR, FLA.

Manatee Harbor is located on the east side of Tampa Bay about 10 miles from the Gulf of Mexico. The project provides for federally maintaining the locally constructed 3 miles of channel and enlarging a turning basin and constructing channel wideners at a depth of 40 feet. The project will allow more efficient use of the existing fleet resulting in transportation savings.

### OATES CREEK, RICHMOND COUNTY, GA.

Oates Creek, a tributary to the Savannah River near Augusta, Ga., is subject to frequent flooding affecting residential, commercial and industrial properties. The plan of improvement provides for stream channel modifications to reduce the flood hazard in the affected area.

### MOBILE HARBOR, DEEPENING, ALABAMA

In the continuing construction program, Mobile Harbor is located in southwest Alabama and extends from the Gulf of Mexico through Mobile Bay to the mouth of the Mobile River. Funds were provided in fiscal year 1987 to initiate harbor improvements by deepening the entrance and harbor channels. The first phase of construction will provide a channel 600 feet wide by 47 feet deep for about 6 miles from the gulf to Mobile Bay and then 400 feet wide by 45 feet deep for another 31 miles to the McDuffie Coal Terminal. A contract to initiate this effort is scheduled for award in June 1987.

### WILLIAM BACON OLIVER LOCK AND DAM, ALA.

Essentially all lands for the new William Bacon Oliver lock and dam have been acquired on the opposite side of the river from the existing lock to allow construction to begin on the cofferdam. The first construction contract was awarded on February 11, 1987.

### PORTUGUES AND BUCANA RIVERS, PUERTO RICO

Last year, heavy rains caused a landslide at the intake tunnel area on the Portugues and Bucana Rivers project in southern Puerto Rico. The slide material has been removed and progress is again underway on the Cerrillos Dam. That work is on schedule. The concrete and stone-lined channel work is scheduled for completion during fiscal year 1987.

## SOWASHEE CREEK, MISS.

Sowashee Creek has a history of flooding dating back to the 1930's. The flood of record occurred in 1936 with damages estimated at about $55 million at today's prices. Channel improvements will provide flood protection to commercial and industrial urban areas of Meridian, Miss. Land acquisition and initial construction will begin this year.

### OPERATIONS AND MAINTENANCE

The largest category of our request is operations and maintenance. We are requesting $218,802,000 to ensure that completed projects remain functional for their authorized purposes. The operations and maintenance program includes a wide range of activities; navigation, both deep draft and inland waterways, flood control, hydropower, and protection of navigation.

### NAVIGATION

Navigation accounts for $133,769,000, allowing us to maintain 29 major harbors of 25 feet or greater depth, 110 smaller harbor and channel projects either annually or periodically, and 3,800 miles of inland waterways with 33 locks and dams. The harbors and waterways are vital to both domestic and international commerce. The major harbors handled in excess of 188 million tons of cargo in 1984. Preliminary estimates show that the harbors handled in excess of 191 million tons in 1985.

### FLOOD CONTROL

Our flood control projects account for $10,285,000 of the request. These projects have yielded benefits of almost $1 billion in flood damages prevented over the last 50 years. This represents seven times the original investment. Due to low water levels in the division area, some of the flood control projects were not exercised last year. However, we were able to accomplish maintenance work more cheaply during the dry conditions.

### MULTIPLE-PURPOSE PROJECTS

The 13 multiple-purpose projects which we operate and maintain account for $61,861,000 of our operations and maintenance request. In fiscal year 1986, the power projects produced over 3 million megawatt-hours of energy. This is equivalent to more than 5.1 million barrels of oil. These projects pay for themselves long before their expected life is exhausted.

As an example, the Lake Lanier project, completed in 1957 at a cost of $48 million, has paid back more that $50 million in hydroelectric power benefits and some $33 million in flood damages prevented. These projects also played a major role in the water management actions to combat the recent drought conditions.

### RECREATION

Even though recreation at our lakes suffered last year, recreation is of vital interest. During 1985, our lakes experienced over 105 million visitations. Seven of the ten most visited Corps' lakes in the nation are in the South Atlantic Division.

### CONCLUSION

The South Atlantic Division continues to have an important and active civil works program, and we look forward to another productive year with all the new projects and the challenges and opportunities that they will provide us.

Mr. Chairman, that concludes my civil works status report. With your permission, I will present a summary of the drought conditions that occurred in our area last year.

### DROUGHT OF 1986 IN SOUTHEASTERN UNITED STATES

The Southeast is unusually rich in water resources, with normally abundant rainfall. However, in 1986, the area was blanketed by the worst drought in 100 years of record.

### WATER STORAGE

A large number of manmade water storage projects authorized and funded by the Congress and constructed by the Corps of Engineers capture and conserve much of the rainfall. The full importance of these reservoirs was not totally appreciated until the drought hit us last year.

### RAINFALL

The rainfall shortage began in late 1985 and continued into mid-1986. Rainfall gauges at Atlanta, Ga., and Charlotte, N.C., reflect the conditions for the period January through July 1986. The normal rainfall for that period in Atlanta is 31.8 inches. The 1986 rainfall was only 16.4 inches, the lowest 7 months of rainfall in 107 years of record. The rainfall deficit was 16 inches at Charlotte. Rainfall was even less in the mountainous regions of Georgia, South Carolina and North Carolina, where rainfall deficits in some locations exceeded 25 inches.

### INFLOWS

Reduced water inflows from rainfall had a significant impact on the lakes and river systems. As an example, the normal monthly average inflows to Lake Lanier, just northeast of Atlanta, are three to four times greater than the 1986 inflows through the month of August. There was almost zero inflow to the lake in July. Statistically, the inflow to Lake Lanier for water year 1986 has a 1-in-200-year recurrence interval.

### DISCHARGES

Atlanta is only one city that would have been in dire straits had not federal lakes been built in the region. Atlanta takes its water supply from the Chattahoochee River, which is discharged from Lake Lanier through Buford Dam. The river must maintain a minimum flow of

1,224 cubic feet of water per second to satisfy minimum water supply and water quality requirements. During the drought, 1,250 cubic feet per second were able to be discharged from the lake. Without the project, the natural river flow would have been only 372 cubic feet per second, which would not meet the minimum water needs of Atlanta.

### PUBLIC ATTENTION

The important role of federal lakes in assisting this region through the drought did not go unnoticed by the state and local leaders and the public. Mr. Leonard Ledbetter, the director of the Georgia Department of Natural Resources, stated in news articles in Atlanta that, "Lake Lanier saved the economy of this area."

### DROUGHT MANAGEMENT

Recognizing early the unusual weather pattern and the increasing drought conditions, a drought management committee composed of representatives from the Corps of Engineers and the states of Georgia, Alabama and Florida was convened to discuss impacts and possible actions. This committee was based on previous agreements between the Corps and the states associated with the management of the Apalachicola, Chattahoochee and Flint Rivers system. Drought management committees were established later in other river basins. Anticipating that the 1986 conditions might continue for 2 or 3 years, the drought committees had to make some difficult water management recommendations to the district engineers associated with the operation of the Corps' federal projects. The most difficult recommendation was to determine which of the many competing authorized water users would have the highest priority.

### WATER SUPPLY

Municipal and industrial water supply emerged early in the discussions as a top-priority use. Management policies took shape with that priority in mind. Water releases from headwater lakes were reduced to the minimum necessary to maintain water supplies and meet water quality standards.

### HYDROPOWER

Reduced releases meant that hydropower production would be limited. Released water was used to the maximum extent possible for power production. The Southeastern Power Administration was especially cooperative throughout the drought and purchased some 384,700 megawatt hours of power at a cost of almost $9.7 million from alternative sources.

### NAVIGATION

Navigation operations on the lower Chattahoochee and Apalachicola Rivers were stopped from July through mid-November. That traffic was just beginning to increase after removal of long-standing rock restrictions from the project channel.

### RECREATION

Recreational use of the lakes was sharply curtailed as shorelines shrank. Marinas, lakeside stores, boating and fishing suppliers and other lake-related businesses suffered significant financial losses.

### RECOVERY

With higher than normal rainfall over the Southeast since September 1986, the drought appears to have bottomed out and water supplies to be on the way to recovery. All the lakes and groundwater elevations have at least made partial recoveries and continue to rise. However, some lakes and ground water levels remain significantly below normal for this time of year. With at least normal rainfall for the remainder of the year, all lakes and ground water levels are expected to recover by late spring. As lake levels continue to increase, we will hold some lakes a little higher than normal this winter in order to enter the spring and summer seasons with as near full pools as possible.

### CONCLUSION

This drought experience has demonstrated the importance of large federal lakes in overcoming rainfall deficits for municipal and industrial water supply. It has also demonstrated the need for considering drought management's importance in the development of water resource management alternatives associated with federally authorized projects operated and maintained under the Corps' stewardship.

Mr. Chairman, this completes my drought report and I will be pleased to respond to any questions.

Senator JOHNSTON. Thank you very much, General Edgar.

Your rainfall has been normal in the last 2 or 3 months, has it not?

General EDGAR. Yes, sir; and in some cases we have been blessed by more than normal rainfall to help replenish the lakes and ground water levels. There is still some degree of concern. As a result, we have adjusted our operating procedures as we enter the spring season.

Senator JOHNSTON. If rainfall continues at normal levels, will you be full by late spring?

General EDGAR. We certainly hope so, sir.

### TENNESSEE-TOMBIGBEE WATERWAY, ALA. AND MISS.

Senator JOHNSTON. General Edgar, tell me about the Tenn-Tom. Is operation normal on the Tennessee-Tombigbee Waterway now?

General EDGAR. Sir, I think that is a success story. Things are going very well on the Tenn-Tom. If you look at the amount of tonnage that has moved over the last 2 years of its operation, this second year has doubled the tonnage of the first year. We are up in the neighborhood of about 5.2 million tons to date since the waterway opened in January 2 years ago.

Senator JOHNSTON. You say about 5.2 million tons?

General EDGAR. Yes, sir.

Senator JOHNSTON. Now, the principal reason for failing to meet the initial goal was because of the depressed coal markets, is that not correct?

General EDGAR. Yes, sir; that is certainly true. We should also consider that the Tenn-Tom opened about 20 months ahead of schedule. The barge lines normally operate on a long-term-type contract. Because of the early opening they were not able to adjust their contracts to move on the Tenn-Tom and were going by other means.

There is another part to the success story. When the waterway opened in January 2 years ago, there were only four ports open. At the end of the first year of operation, we had eight ports open. Today there are 12 ports open. I think this is indicative of the commitment of the communities and states involved and associated with the Tenn-Tom in putting up their share of the development of the region. It is very heartwarming when you ride down the Tenn-Tom and see all the development that is going on.

Senator JOHNSTON. Do you expect that the Tennessee-Tombigbee Waterway will live up to its projected benefits and the benefit-cost analysis when you get time to readjust these contracts, et cetera?

General EDGAR. Mr. Chairman, I certainly have no doubt that it will.

Senator JOHNSTON. Thank you very much, General Edgar. I wish you were there to speak to some of the critics of the Tenn-Tom who just simply looked at the first year's traffic and said the project is a lemon. I share your enthusiasm for it.

Senator Cochran?

Senator COCHRAN. Thank you, Mr. Chairman.

I was glad to hear the report on the Tenn-Tom Waterway and to get your perspective on its use and what the future holds. I think the public is becoming more aware of the existence of it and the fact that it is a very vital and important part of our nation's transportation system. I think a lot of it has to do with the construction of these ports. That indicates the commitment of the local communities.

I know in Columbus, Miss., the local community is very much involved in the construction of a harbor project there, and I think the Corps of Engineers has been helpful in assisting in that harbor development. We appreciate that and hope that will continue.

### SOWASHEE CREEK, MISS.

I also want to thank you for including in your remarks a report on the status of the Sowashee Creek project in the Meridian, Miss., area. That has been a very troublesome waterway. Channel improvements, according to your statement, will provide flood protection to some of the business and urban areas there in Meridian, and construction will begin this year.

General EDGAR. That is correct, sir.

Senator COCHRAN. We want to be sure to keep that project moving along as quickly as we can.

General EDGAR. Yes, sir; it is on schedule and we are very enthusiastic as are the local folks, as you might imagine. The local cooperation agreement is scheduled to be completed this April. If that proceeds as planned, then we can anticipate the construction to begin this summer.

Senator COCHRAN. That is good news.

We appreciate your providing this information to the committee. It is very reassuring to hear the outlook for the Tennessee-Tombigbee Waterway and the prospects for growth of shipments on that waterway.

Thank you very much, Mr. Chairman.

Senator JOHNSTON. Thank you, Senator Cochran.

General Edgar, we are very glad to have you here to update the committee on your activities—you have done very well. We look forward to your coming back again.

General EDGAR. Thank you very much, Mr. Chairman.

### SUBMITTED QUESTIONS

Senator JOHNSTON. We have some questions for the record.

General EDGAR. Yes, sir.

[The following questions were not asked at the hearing but were submitted to the Corps for response for the record:]

## QUESTIONS SUBMITTED BY SENATOR JOHNSTON

### FISCAL YEAR 1985 SUPPLEMENTAL PROJECTS

Senator JOHNSTON. I note that the fiscal year 1988 budget request includes funds to begin the major construction work on several of the new projects contained in the fiscal year 1985 supplemental. Why has it taken 2 years to get these projects underway?

General EDGAR. The projects included in the fiscal year 1985 Supplemental Appropriations Act were authorized subject to terms and conditions concerning local cooperation acceptable to the Secretary of the Army that would be set forth in a binding agreement for cost sharing with non-federal interests desiring to participate in project construction. Binding agreements had to be completed prior to 30 June 1986.

Also, the initiation of inland waterway projects required funding from the Inland Waterway Trust Funds established by the Inland Waterways Revenue Act of 1978 and procedures had to be worked out with the Treasury Department to remove funds from this account. Generally, non-federal interests were reluctant to sign binding agreements until the specific requirements of local cost sharing were established by law; however, we successfully negotiated four of the five required. Gulfport Harbor's design had not proceeded to a level which allowed an agreement to be negotiated, but we are proceeding with design. In addition, we could not initiate construction on these commercial harbor improvement projects and inland waterway navigation projects until enactment of legislation which provided for a federal port user fee and an increase in the inland waterway fuel charge. However, funds were used in the intervening period for preconstruction planning on these navigation projects. Enactment of the Water Resources Development Act of 1986 established the criteria for cost sharing and has allowed us to proceed with construction in accord with permanent legislation.

Although these actions have taken 2 years, the time has been used to complete project designs and coordinate the local responsibilities including the execution of local cooperation agreements. Construction is scheduled to be initiated in fiscal year 1987 on four of the five projects included in the fiscal year 1988 budget request that were included in the fiscal year 1985 Supplemental Appropriations Act.

### MOBILE HARBOR, ALA.

Senator JOHNSTON. Congress appropriated $15 million for the current year to deepen the Mobile Harbor navigation channel and nearly $9 million was transferred from the project. How do you explain this action?

General EDGAR. Sir, the contract award was delayed from October 1986 to June 1987 creating a surplus of $9 million which was transferred from the project. The $15 million appropriated in fiscal year 1987 for the Mobile Harbor deepening project was based on a contract award date of October 1986 to construct a channel 57 feet deep by 600 feet wide for a distance of 7.8 miles from the Gulf of Mexico to Mobile Bay and a channel 55 feet deep by 400 feet wide from the mouth of the bay north for a distance of 3.0 miles to a transhipment facility. Since that time, local interests determined that constructing the transhipment facility was not the most effective use of their funds and elected the current plan to construct a channel 47 feet deep by 600 feet wide for a distance of 6.1 miles from the Gulf of Mexico to Mobile Bay and a channel 45 feet deep by 400 feet wide from the mouth of the bay north for a distance of 31.2 miles to the McDuffie Coal Terminal. This change in design, coupled with the delay until the enactment of the Water Resources Development Act of 1986 which provided for a federal port user fee, has delayed the contract award until June 1987. The local cooperation agreement was executed in June 1986 and amended in December 1986.

### CONSTRUCTION—NEW STARTS

Senator JOHNSTON. Your Division has three additional new projects proposed in the fiscal year 1988 budget. Do you think it will take as long to get the major activities on these projects going?

General EDGAR. No, sir. Local interests have indicated a willingness to cost-share on all new construction starts in accordance with the Water Resources Development Act of 1986. We anticipate awarding the initial construction contract on each of those projects in fiscal year 1988.

### MANATEE HARBOR, FLA.

Manatee Harbor is located on the east side of Tampa Bay, about 10 miles from the Gulf of Mexico. The project provides for maintaining the locally constructed 40-foot depth channel, enlarging the existing turning basin, and constructing channel wideners at the bends, all at a depth of 40 feet. The project will remove restrictions and safety hazards to navigation, thereby reducing transporation costs. The project would also provide greater economic stability for the area and induce development of port facilities. The local cooperation agreement is scheduled to be negotiated during the first quarter of fiscal year 1988. The initial construction contract is scheduled for award in June 1988.

### CHARLESTON HARBOR, S.C.

Charleston Harbor is located at about the midpoint of South Carolina's Atlantic coast. The project provides for deepening the outer bar and jetty channel from 37 to 42 feet, deepening the remaining portion of the channel from 35 to 40 feet, with like depth in the turning basins, and enlarging the turning basins to a 1,200-foot turning diameter. The project also provides for deepening the shipyard river channel to 38 feet with enlargement of the turning basin to 1,000-foot turning diameter. The project extends the channel for 2 miles in the Wando River at a depth of 40 feet. The improvement will result in transportation savings by the use of larger vessels and reduction of existing hazards to navigation. The local cooperation agreement is scheduled to be executed in July 1987. The initial construction contract is scheduled to be awarded in March 1988.

### OATES CREEK, RICHMOND COUNTY, GA.

Oates Creek in the Savannah River basin is a highly urbanized stream with a drainage area of 4.7 square miles on the southwestern edge of metropolitan Augusta, Ga. The residential and commercial development in the area is subject to frequent flooding, endangering life, flooding sewers, contaminating water supplies, and destroying public service facilities. The project provides for channel improvements and levee construction to reduce flooding in the developed areas. The local cooperation agreement is scheduled to be completed in December 1987. The initial construction contract is scheduled to be awarded in September 1988.

### MANPOWER

Senator JOHNSTON. Given the heavy workload on the military construction side and the increasing activities on the water resource projects, do you have now or do you foresee any problems in carrying out your civil works responsibilities because of lack of manpower?

General EDGAR. Sir, our military program design is contracted at a rate of 80 percent, which is more than we would like. This is necessary due to our large military workload. Regarding civil works, Public Law 99-662 has resulted in an imbalance of new authorized work distribution across the country. We have more than our share of work, and have willing sponsors which indicates that the Division's future is secure. We are working with our headquarters to solve the manpower imbalance given our present and future workload. Consequently, I do not foresee any manpower problems which would prevent us from carrying out our civil works responsibilities.

### DREDGE DISPOSAL AREAS

Senator JOHNSTON. Are you experiencing any dredge disposal problems on projects in your area of jurisdiction? If so, what are the issues involved and what has been the impact on project costs?

General EDGAR. Sir, the disposal of dredged material is a constant concern as it relates to our projects in both construction and maintenance. Environmental concerns are the primary issues involving the methods and locations used in disposing of dredged material. The construction cost for the Mobile Harbor, Ala., project has increased $41.2 million to transport the dredged material to the gulf for disposal, as required by Public Law 99-662. Similarly, regarding the Gulfport Harbor, Miss., project which is still in the design stage, we have increased the estimated construction cost $29 million for disposal of dredged material in the gulf. The design effort has not progressed sufficiently to be specific on cost for the Pascagoula Harbor, Miss., project. However, we anticipate a problem with the disposal of the dredged material from that project. In these specific cases, environmental concerns are the reason dredged material is being transported to the gulf. At the present time, we are not experiencing any specific dredged material disposal problems associated with our maintenance program that are delaying dredging contracts or causing shipping delays. We must continually manage our upland dredged material disposal areas to maximize the life of the area. Real estate costs for new upland areas are very expensive. Disposal of dredged material in the gulf sounds is becoming more restricted due to environmental concerns and the unsuitability of the dredged material. Therefore, we anticipate that more and more dredged material will have to be disposed of in deep water, either the gulf or the ocean, at an increased cost to all our projects.

### CENTRAL AND SOUTHERN FLORIDA, FLORIDA EVERGLADES NATIONAL PARK

Senator JOHNSTON. How are the Corps' data collection activities related to additional water deliveries to the Everglades National Park proceedings?

General EDGAR. A 2-year test of rain-driven water deliveries to Everglades National Park will be complete in June 1987. As a part of this test, operational procedures were developed to prevent increasing flood risks in the developed portion of the East Everglades. Agricultural interests signed a legal agreement with South Florida Water Management District that outlined these criteria. There have been no flood damages reported during the tests which has now covered two wet seasons. It has been possible to restore a large volume of flow through the East Everglades, however, the operational criteria being used has restricted the total wet season flow to less than half of the desired amount during both wet seasons. There is a general consensus among those involved with the test that it has been successful within its limitation.

Senator JOHNSTON. Will the period through December 1988 be sufficient to gather enough data on which to make a recommendation?

General EDGAR. The ecological responses to changes in hydrologic conditions in the Everglades occur over periods of 5 to 10 years, or possibly more. The current test has now covered less than 2 years. A much longer period of hydrologic and ecologic data collection associated with modified water deliveries to the park will be necessary to identify ecological responses and establish a correlation between such responses and water management practices. However, we will have sufficient information to prepare a general design memorandum to develop designs for a physical system that will enable adequate flexibility for a range of operational strategies. Potential hydrologic conditions that could be accomplished by this system are being predicted with a computer model and the resulting environmental impacts are also being predicted. Continued testing of water deliveries to Everglades National Park will be required to fine tune the operation of the physical system being designed in the general design memorandum.

Senator JOHNSTON. Bring the committee up todate on the Corps' needs to acquire adversely impacted agricultural lands and on the construction of flood control measures to protect homes in the impacted area.

General EDGAR. The general design memorandum is addressing the issue of potential adverse impacts on residential and agricultural areas in the East Everglades area that would result from the alternative water delivery plans being considered. The following three alternatives are being considered: (1) Flood protection of the residential areas and acquisition of the agricultural area; (2) flood protection of the residential and agricultural areas; and (3) acquisition of the residential and agricultural areas. The general design memorandum is also addressing the issue of what real estate interest, if any, will be required for the undeveloped privately owned marsh area that comprises the remainder of the East Everglades. These studies will be completed this fiscal year.

Senator JOHNSTON. Are all parties in agreement on the operational plan?

General EDGAR. Through intense coordination and negotiation with south Dade County agricultural interests, operational criteria for the current test were agreed upon prior to its initiation. However, the agricultural interests have expressed several concerns about the degree of flood protection provided during the test. Even though the test successfully enabled relatively large flows through the East Everglades, such flows have been restricted to less than half of the total desired wet season volumes. Coordination has been initiated to develop operational criteria to be used for the next test which is scheduled to begin in June 1987.

## SOWASHEE CREEK, MISS.

Senator JOHNSTON. What is the schedule for obtaining a binding local cost-sharing agreement on the Sowashee Creek project in Mississippi?

General EDGAR. The initial meeting with the local sponsor was held on 17 February 1987. It is anticipated that a second meeting will be held not later than 6 March 1987 to resolve any issues in the draft local cooperation agreement. A fully executed agreement is expected by 15 May 1987.

Senator JOHNSTON. What work is planned for fiscal year 1988?

General EDGAR. Sir, in anticipation of obtaining a binding local cooperation agreement we have scheduled the completion of the contract for the lower 5.3 miles of the project involving channel widening, clearing, and snagging, construction of two flood control structures, bridge protection at three highway bridges and two railroad bridges, and riprap bank protection; and the award of the contract for the upper 5.2 miles of the project to provide channel widening, clearing, and snagging, construction of one flood control structure, bridge protection for seven highway bridges and two railroad bridges and 500 feet of riprap bank protection downstream of another highway bridge.

Senator JOHNSTON. Do you foresee, at this time, any reason why construction on this project would be delayed in fiscal year 1988?

General EDGAR. No, sir; we do not foresee any reason for the construction of this project to be delayed in fiscal year 1988.

## KISSIMMEE RIVER, FLA.

Senator JOHNSTON. There have been press reports recently about the restoration of the Kissimmee River in Florida to its natural state. I believe this is a unique, first-of-a-kind project. Briefly, discuss the factors surrounding this proposal.

General EDGAR. At the request of the State of Florida, the Corps of Engineers implemented flood control measures within the Kissimmee River basin in the mid-1960's. Those measures included canalization of the Kissimmee River to provide a multipurpose water management project. Recently, the project has been purported to have contributed to the eutrophication of Lake Okeechobee. That concern led to a study to reestablish the environmental values of the Kissimmee River. The study was completed in October 1985 and recommended that a restoration project was not in the federal interest.

Senator JOHNSTON. Is there a consensus at the local level and what is the state's position on this proposal?

General EDGAR. There is no consensus on the restoration effort at the local level. State regulatory agencies and concerned environmental organization favor total restoration of the river. Local interests including landowners, agricultural concerns, and recreational boating enthusiasts oppose the restoration effort.

Senator JOHNSTON. How does this new authorization impact on-going studies?

General EDGAR. Although the Water Resources Development Act of 1986 authorizes the review of existing projects to determine the need for modifications for the purpose of improving the quality of the environment, the existing project within the Kissimmee River basin is functioning as it was designed to provide flood damage prevention, water conservation, improved water management capabilities, and to accommodate unimpeded navigation.

Senator JOHNSTON. Is there a federal interest in restoring the river to its original state?

General EDGAR. There is no federal interest in restoring the Kissimmee River to its original state at this time based on current policy. Study recommendations of minor project modifications contained within the feasibility report have been implemented by state and local interests.

Senator JOHNSTON. What would be the estimated cost and benefits of such a project?

General EDGAR. Complete restoration of the Kissimmee River is estimated to exceed $100 million. The cost associated with major modification of the canal would not be offset by the environmental benefits accrued. These benefits are expected to be site specific within that basin, resulting in little or no benefit extension to southern Florida.

## MANTEO (SHALLOWBAG) BAY, N.C.

Senator JOHNSTON. Please update the committee on the Corps' activities related to the Manteo (Shallowbag) Bay project in North Carolina.

General EDGAR. Sir, we have currently advertised a contract for an independent economic review of the Manteo (Shallowbag) Bay project. Plans and specifications for the jetties have been completed. All other design effort has been placed on hold until land issues are resolved with the Department of the Interior.

Senator JOHNSTON. What information do you have relating to annual dredging costs, inlet closings, vessel groundings, and the time periods over the past 3 years when the authorized 14-foot depth was not available?

General EDGAR. The average annual maintenance cost for the period from fiscal year 1983 through fiscal year 1986 is $4.5 million. During this period, we have been able to maintain the 14-foot depth approximately 36 percent of the time, with an increased hopper dredging program. There have been no official inlet closings, however, there have been an average of 34 reported groundings each of the last 3 years. The independent review will evaluate the cost effectiveness of maintaining the existing 14-foot channel.

Senator JOHNSTON. What is the status of the update analysis of the project economics and specifically are any changes related to commercial fishing benefits?

General EDGAR. The update on the project economics will be completed in June 1987. This review will determine if any significant changes in projects benefits, including commercial fishing benefits, and costs have occurred.

### RANDLEMAN LAKE, N.C.

Senator JOHNSTON. How is the Corps proceeding on the Randleman Lake pro North Carolina for which Congress appropriated $2 million for the current year?

General EDGAR. Sir, preconstruction engineering and design effort on the proj essentially complete. Minor work is required to complete the plans and specificati the initial construction contract. Further design effort and real estate activities a hold pending a determination of whether the project meets current criteria for f participation in construction of water projects.

Senator JOHNSTON. What is the current position of the administration on the pr

General EDGAR. In order to have federal participation in constructing flood c projects, current policy requires that a minimum of 10 percent of the total esti project benefits should be specifically for flood control purposes. A report o reanalysis of the project benefits is being prepared to determine the current p economics. That study has not yet progressed to the point of developing new inf tion which suggests that flood control benefits meet the current criteria for Federal ticipation in the construction of water projects.

Senator JOHNSTON. What is the schedule for completing the reanalysis repo project economics?

General EDGAR. Sir, the report is scheduled to be completed in April 1987.

### SUBCOMMITTEE RECESS

Senator JOHNSTON. We will stand in recess until Tuesday, Febr 24.

[Whereupon, at 3:50 p.m. Thursday, February 19, the subcommi was recessed to reconvene at 10 a.m. Tuesday, February 24.]

# ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 1988

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TUESDAY, FEBRUARY 24, 1987

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
*Washington, DC.*

The subcommittee met at 10:08 a.m. in room SD–192, Dirksen Senate Office Building, Hon. J. Bennett Johnston (chairman) presiding.

Present: Senators Johnston, DeConcini, Hatfield, and Specter.

## DEPARTMENT OF THE ARMY—CIVIL

### CORPS OF ENGINEERS—CIVIL

### OHIO RIVER DIVISION

### STATEMENT OF COL. ERNEST J. HARRELL, DIVISION ENGINEER

ACCOMPANIED BY:
- LOUIS R. LISTERMANN, CHIEF, PROGRAMS MANAGEMENT OFFICE
- KENNETH D. HARACK, PROGRAMS MANAGEMENT OFFICE
- RICHARD ARMSTRONG, CHIEF, ENGINEERING DIVISION
- JIMMY F. BATES, CHIEF, PLANNING DIVISION

### OPENING REMARKS

Senator JOHNSTON. The hearings will come to order. Good morning, gentlemen. This morning we will continue our hearings on the fiscal year 1988 budget of the Corps of Engineers. First, we will hear from Col. Ernest J. Harrell, Division Engineer of the Ohio River Division; followed by Brig. Gen. Charles E. Dominy, Division Engineer of the Missouri River Division; and finally Brig. Gen. Patrick J. Kelly, Division Commander for the South Pacific Division.

We extend a warm welcome to each of you and members of your staff who are with you today. It is a pleasure to have all of you here.

Senator JOHNSTON. First, Colonel Harrell, if you would introduce the members of your staff who are accompanying you, then proceed in your own way. We have your full statement which will be placed the record.

So Colonel Harrell, you may proceed.

## INTRODUCTION OF ASSOCIATES

Colonel HARRELL. Thank you. Mr. Chairman, I am pleased to have my first opportunity to report to you on the work of the Ohio River Division. With me on my left is Mr. Lou Listermann, Chief of Programs Management, and Mr. Richard Armstrong, Chief of Engineering. On my right is Mr. Ken Harack, also of the Programs Management Office, and Mr. Jim Bates, Chief of Planning. I would like to submit for the record my status report and give you a brief summary.

## AREA OF RESPONSIBILITY

My Division is responsible for water resources development within the 204,000-square-mile Ohio River basin. This area, which includes portions of 14 states and 69 congressional districts, has population of 25 million.

Expenditures for the past 4 years and our current year program are shown here. Our present estimate for fiscal year 1987 is $320 million. Our fiscal year 1988 budget request is $284.5 million. These items will be addressed in turn.

## GENERAL INVESTIGATIONS

The budget request for general investigations will be used to continue 11 feasibility studies and initiate a reconnaissance phase of a flood damage prevention study. Funds will also be used to continue preconstruction engineering and design of one navigation and five flood control projects.

## LOCKS AND DAMS 52 AND 53

Last year, the Chief of Engineers recommended replacement of locks and dams 52 and 53 on the lower Ohio River. The proposed $566 million replacement project near Olmstead, Ill., envisions two 110-by-1,200-foot lock chambers and a navigable pass dam. We are continuing the preconstruction engineering and design and the general design memorandum is presently scheduled for completion in fiscal year 1989.

## CUMBERLAND AND TENNESSEE RIVERS

Planning efforts are continuing on the lower Cumberland and Tennessee River systems. The two major locks—Kentucky lock on the Tennessee River and Barkley lock on the Cumberland—are connected on the upstream side by a short navigation canal, giving tows the option of using either for access to the Ohio River system. Because of the lower Cumberland's tight and narrow bends, pilots generally elect to use Kentucky lock. This results in over 90 percent of the traffic using that lock and causing delays of up to 19 hours while Barkley goes underutilized. We are currently scheduled to complete a report on this problem in fiscal year 1988.

## WABASH RIVER NAVIGATION

We are nearing completion of the Wabash River navigation study. If our reconnaissance report identifies economically justified alternatives, we will move forward with the feasibility study which will cost $2.3 million.

### CONSTRUCTION, GENERAL

In fiscal year 1988, nearly $103 million will be used to complete and continue construction of 12 projects and continue engineering and design and land acquisition of 4 others.

The Water Resources Development Act of 1986, Public Law 99–662, authorizes the replacement of locks 7 and 8 on the Monongahela River. Lock and dam 7 will be replaced by a new lock and fixed crest dam at Grays Landing, Pa. Our estimate to construct this 84-by-720-foot lock and dam is $123 million. We are continuing engineering and design and land acquisition. Lock 8, now called Point Marion, will be replaced on site with an 84-by-720-foot lock, using the existing dam. We are continuing engineering and design of this estimated $83 million project. At Gallipolis locks and dam, Public Law 99–662 authorizes the construction of a $336 million project with new locks and rehabilitation of the existing dam. A canal, located in West Virginia landward of the existing locks, will include the 110-by-1,200-foot main lock and the 110-by-600-foot auxiliary lock. Acquisition of real estate was initiated in 1985 and is continuing. Plans and specifications will be advertised for bids in July of this year, and a construction contract award is scheduled for October.

Winfield locks and dam on the Kanawha River is the busiest on the Ohio River system in terms of lockages caused by its limited capacity. Most tows require two, three, or four cuts to complete the locking process. Waiting time and lockage time together average nearly 9 hours. A new 110-by-800-foot lock was authorized by Public Law 99–662, subject to approval of the report by the Secretary. The new lock will be added landward with one of the existing chambers to remain operational. Our feasibility report recommending construction of the $153 million lock is now being reviewed by the Board of Engineers for Rivers and Harbors. During fiscal year 1988, we plan to continue work on the general design memorandum, foundation investigations, and model tests.

### STONEWALL JACKSON LAKE, W. VA.

The $208 million Stonewall Jackson Lake project in West Virginia is on schedule for completion in September 1989. Available for full flood control storage, the reservoir is scheduled for permanent impoundment beginning this fall.

### YATESVILLE LAKE, KY.

A $24.6 million contract for construction of the remainder of the Yatesville Lake dam and outlet works in Kentucky was awarded in April 1986. The project is scheduled for completion in September 1992.

### SECTION 202 PROGRAM

Planning, design, and construction of projects under section 202 of Public Law 96–367 are well underway. A budget request of $14.4 million will be used in the Williamson, W. Va., area to continue real estate acquisition and construction of major project features. Acquisition of real estate for the central business district flood protection project is also underway, as are engineering and design of the flood wall and pumping stations. We intend to begin construction in February 1988 with completion in June 1992. The pump station in West Williamson has been completed. Construction of the flood wall was initiated in August 1986 and is scheduled for completion in September 1990. The approved plan for Matewan, W. Va., provides for a mixture of structural and nonstructural measures. Detailed planning is complete and implementation of nonstructural measures is underway. Our budget request provides $1.8 million for continuation of engineering and design for structural project features. The joint federal/state flood protection and highway project at Pineville, Ky., is scheduled for completion in fiscal year 1988. This year's budget request of $8.5 million will be used to continue real estate acquisition and construction of levee and floodwall features. Construction of the Barbourville, Ky., high-flow diversion channel has been completed. The channel has already demonstrated its usefulness by reducing both the February and the November 1986 floods by 2.5 feet. Fiscal year 1987 funds will be used to award a contract to initiate and complete construction of the Highway 459 bridge over Richland Creek.

### Mill Creek, Ohio

The $149 million Mill Creek, Ohio, project, which extends through a highly industrialized section of Cincinnati, is on schedule and is 29-percent complete.

### Big South Fork, Ky. and Tenn.

For the Big South Fork National River and Recreation Area, we will complete the land acquisition and construction of the Blue Heron campground, overlook, and road. The $3.6 million requested in fiscal year 1988 will complete all scheduled work.

### MAJOR REHABILITATION AND DAM SAFETY ASSURANCE

Now I would like to talk about our major rehab and dam safety assurance program. Our effort focuses on upgrading structures that have either seismic or hydrologic deficiencies.

### Montgomery Locks and Dam

The $7.7 million requested for rehabilitation work on Montgomery locks and dam will be used for new lock gates and for repairs to concrete, bulkheads, dam gates, and other associated items. The total cost to rehabilitate this project is $33.2 million. The project is scheduled for completion in March 1989.

### Muskingum River Lakes

The 14 dams built between 1934 and 1938 in the Muskingum basin experienced downstream seepage, settlements of dikes, low spots on the rim, and potentially unstable dam slopes. All rehabilitation work has been completed on seven of these dams. The estimated cost of the work to be funded from the "Construction general" appropriation is $25.3 million. Rehabilitation on the remaining seven dams is scheduled for completion in December 1988. A $7.8 million contract has been awarded for correcting a spillway deficiency problem at Mohawk Dam in Ohio. The work includes raising the earth dam, installing a concrete parapet wall on the upstream side of the crest, and widening the spillway.

## OPERATION AND MAINTENANCE PROGRAM

The $159 million for the operations and maintenance program is 56 percent of the total Ohio River Division budget. Because of the advancing age and heavy usage, our projects are experiencing structural distress which requires increasing emphasis on their maintenance. We are dedicated to extending their usefulness by judicious use of limited resources. Operational demands continue to increase. Our navigation system handled over one-quarter of the total inland waterway freight tonnage of the nation. We also operate an extensive network of flood control reservoirs and local protection projects, which annually prevent significant flood damages.

## Dashields Locks and Dam

This request includes $9.8 million for continuing rehabilitation of Dashields locks and dam on the upper Ohio River. We estimate total rehabilitation will require $26.7 million, with planned completion in December 1989.

## Muskingum River Lakes

Continued rehabilitation of the remaining projects in the Muskingum River basin, now funded under the "Operations and maintenance" appropriation, will require $3 million in fiscal year 1988. The estimated total cost of this work is $17.4 million.

## FLOOD DAMAGES PREVENTED

The American people have invested over $2.8 billion in the Ohio River basin's 77 flood control reservoirs and 87 local flood protection projects. These projects have prevented nearly $9 billion in cumulative basinwide flood damages, a return of over $3 for every $1 dollar invested.

## WATER RESOURCES DEVELOPMENT ACT OF 1986

I want to conclude my status report with a brief look at the Water Resources Development Act of 1986 and its impact on the Ohio River Division. As has been noted, the long-needed passage of a water resources bill cleared the way for a number of vital projects. The bill authorizes four major lock and dam projects in the Ohio River Division, with a total estimated cost of nearly $700 million. It also establishes the Inland Waterways Users Board, an organization which should have a major impact on the future development of the inland waterways system. It authorizes nearly $162 million for flood control projects, increases the program limits of small projects by $25 million, and provides for additional work in water resources conservation and development.

The highly successful Summersville Lake releases for the whitewater recreation program are now authorized as a project purpose. The new cost-sharing provisions guarantee that nonfederal interests will play an important role in planning, financing, and maintaining Corps of Engineers water projects. We think the work and cost sharing reforms authorized in Public Law 99–662 are very important to the economic life of this country. We are proud to have the opportunity to contribute to the development of the nation's water resources. We are committed to doing the very best we can in this effort. The needs of the people demand the most professional expertise we can provide.

### PREPARED STATEMENT

This completes my brief statement. I will provide my full statement for the record. Thank you.

[The statement follows:]

## STATEMENT OF COL. ERNEST J. HARRELL

Mr. Chairman and members of the Committee, this is my first report to you since assuming command as Ohio River Division Engineer. It is a pleasure to appear before your Committee to report on the status of work in the division.

### AREA OF RESPONSIBILITY

The Ohio River Division is responsible for water resources development within the 204,000 square-mile Ohio River Basin. This area, which includes portions of 14 states and 69 Congressional districts, has a population of 25 million. The Ohio River Basin is a major agricultural, industrial, and manufacturing portion of the nation.

The division, centrally located at Cincinnati, Ohio, has district offices in Pittsburgh, Penn., Huntington, W.Va.; Louisville, Ky.; and Nashville, Tenn.

This status report covers division expenditures for the past four years, our programmed expenditures for the current year, and our Fiscal Year 1988 budget. We will look at the four major programs comprising the budget: General Investigations; Construction; Major Rehabilitation and Dam Safety Assurance; and Operations and Maintenance.

### EXPENDITURES FISCAL YEARS 1983-1987

Expenditures for the past four years and for our current year program are as follows:

| | |
|---|---|
| FY 83 | $337,809,000 |
| FY 84 | 287,940,000 |
| FY 85 | 315,700,000 |
| FY 86 | 311,498,000 |
| FY 87 | 320,000,000 (Est.) |

### FISCAL YEAR 1988 BUDGET

Fiscal Year 1988 budget request is detailed below. These items will be addressed in turn.

| | |
|---|---|
| General Investigations | $ 10,446,000 |
| Construction | 102,875,000 * |
| Rehabilitation & Dam Safety | 11,800,000 |
| Operations & Maintenance | 159,377,000 ** |
| TOTAL | $284,498,000 |

* Includes $5.0 million to be derived from the Inland Waterways Trust Fund.

** Includes $12.8 million to continue major rehabilitation of Dashields Locks and Dam and the Muskingum River Lakes.

### GENERAL INVESTIGATIONS

The General Investigations program includes both feasibility studies and preconstruction engineering and design activities. The budget request will be used to continue 11 feasibility studies and initiate a reconnaissance phase of a flood damage prevention study in the metropolitan Cincinnati, Ohio, area. Funds will also be used to continue preconstruction engineering and design of one navigation project and five flood control projects.

| | Start | Cont. | |
|---|---|---|---|
| Surveys | 1 | 11 | $ 8,071,000 |
| Preconstruction Engineering & Design | 0 | 6 | 2,375,000 |
| TOTAL | | | $10,446,000 |

### Ohio River Navigation System

The Ohio River navigation system is the hub of the entire inland waterways system. To insure the economic efficiency of this system, we are planning the improvements that will be necessary to meet future commercial traffic demands on our waterways.

### Locks and Dams 52 and 53

Last year, the Chief of Engineers recommended replacement of Locks and Dams 52 and 53 with a single, high-lift navigable dam located near Olmsted, Ill., about 17 miles above the river's mouth. As we have previously reported, when the existing locks are not fully operational, major delays are experienced which cost the navigation industry millions of dollars.

The report is currently under review by the Assistant Secretary of the Army for Civil Works. The proposed replacement project envisions two 110-foot-wide by 1,200-foot-long lock chambers and a navigable pass dam which would allow unimpeded navigation about 60 percent of the time. When closure would be required, the modern lock facility would reduce lockage time and provide considerable savings to the industry. Estimated cost for the project is $566 million. We are continuing the preconstruction engineering and design of the project, and are currently concentrating on foundation explorations along with model testing, dam gate and environmental studies. The General Design Memorandum is presently scheduled for completion in Fiscal Year 1989.

### Lower Cumberland and Tennessee Rivers

Planning efforts are continuing on the lower Cumberland and Tennessee Rivers. The Tennessee River System is a series of ten locks and dams and the Cumberland River System has four locks and dams. Together these systems form the northern gateway to the Tennessee-Tombigbee Waterway. The two major locks, Kentucky Lock on the Tennessee River and Barkley Lock on the Cumberland, are connected on the upstream side by a short navigation canal, giving tows the option of using either for access to the Ohio River System. However, because of the lower Cumberland's ten tight and narrow bends, pilots generally elect to use Kentucky Lock. This results in approximately 93 percent of the traffic using that lock and causing delays of up to 19 hours while Barkley goes underutilized.

We are currently scheduled to complete a report on this problem in Fiscal Year 1988. Alternatives being evaluated include construction of an additional lock chamber at Kentucky Lock, bendway modifications to the lower Cumberland River, and a connecting canal on the downstream side of the locks. A phased construction plan is also being evaluated that would include bendway modifications with future Kentucky Lock expansion.

### Wabash River Navigation

We are continuing work on the Wabash River Navigation Study and expect to have the reconnaissance phase of the study completed in April 1987. If at that time the benefit to cost ratio is favorable, we will move forward into the feasibility phase. This study is investigating the feasibility of providing navigation improvements from the mouth of the Wabash to either Mt. Carmel or Terre Haute, Ind. Alternatives include an all river route and a canal or a separate upland route. We are also looking at standard tows of four, six, and eight barges. The cost of the feasibility study is $2.3 million.

### Other Navigation Study Areas

Feasibility planning to evaluate improvements at other navigation projects is in the early stages. Studies for improvement or modernization of Emsworth, Dashields, and Montgomery locks and dams on the Upper Ohio River and Locks and Dams 2 through 4 on the Lower Monongahela River will be completed in Fiscal Year 1989. A similar study is underway for McAlpine Locks and Dam at Louisville, Ky. With strong increases in traffic on the Lower Ohio River, we anticipate that congestion at McAlpine will lead to growing delays and the need for increased capacity. This study is scheduled for completion in Fiscal Year 1988.

### Local Flood Protection Projects

This year, feasibility level reports will be completed by the districts which recommend flood protection projects at three locations: Scioto River, West Columbus, Ohio; Bartons and Sinking Creeks at Lebanon, Tenn.; and Guyandotte River at Mullens, W.Va. The West Columbus project would entail a $31 million levee/floodwall along the Scioto River which would protect some 1,200 acres of highly-urbanized development. The Lebanon, Tenn., and Mullens, W.Va., projects would consist of a dry bed reservoir and channel work respectively at these communities. Since the costs of these two projects would be less than $5 million each, we, if they are found to be feasible, would recommend that they be implemented under Section 205 of the Continuing Authorities Program.

In addition, with Fiscal Year 1987 funds, we will continue on-going feasibility study efforts. Of particular interest is our study of the flooding problems in the Greenbrier Basin of W.Va., where a disastrous 1985 flood resulted in a need to re-examine alternatives which might address this significant flooding problem. Fiscal Year 1987 funds will be used to continue Preconstruction Engineering and Design at Fairfield, Holes Creek, Logan, Nelsonville, and North Chillicothe, Ohio. All of these projects are authorized by Public Law 99-662, the Water Resources Development Act of 1986.

The Fiscal Year 1988 budget recommendation includes funds to initiate our new feasibility study start, Metro Cincinnati, Ohio. This study will focus on alternatives for alleviating flooding problems in the seven county metropolitan Cincinnati area of southwest, Ohio, southeast Indiana, and northern Kentucky.

Fiscal Year 1988 funds will also be used to continue feasibility studies at Grandview Heights, Ohio; in the Harpeth River Basin; and in the Marlinton/Greenbrier Basin and complete feasibility studies in the Lower Scioto River Basin. Preconstruction Engineering and Design will be continued at the five previously mentioned projects. Completion of Preconstruction Engineering and Design at these projects will ready the first element of these projects for construction.

### Associated Water Supply Studies

Fiscal Years 1987 and 1988 General Investigations funds are being used to continue study efforts to address water supply needs as part of multi-purpose project development.

Parts of the Ohio Basin are experiencing significant urban and economic development coupled with long-standing water supply problems. These problems are particularly acute in the central Kentucky area around Lexington and Frankfort, Ky., where significant new industrial growth is projected (Toyota plant at Georgetown) and where new surface supplies of water appear to be the most viable way of meeting these increased demands. Our Fiscal Year 1987 new start at Station Camp Creek, Ky., and our ongoing Kentucky River and Tributaries survey will be addressing opportunities to serve water supply needs while addressing flood control and other potential project purposes.

## CONSTRUCTION

In Fiscal Year 1988, $102.875 million will be used to continue construction of 10 projects, continue engineering and design and land acquisition for four projects and complete scheduled construction of two projects.

| | Projects | |
|---|---|---|
| Navigation | 5 | $ 14,492,000 * |
| Flood Control | 10 | 84,800,000 |
| National Recreation Area | 1 | 3,583,000 |
| TOTAL | | $102,875,000 |

* Includes $5 million to be derived from the Inland Waterways Trust Fund.

### Locks and Dams 7 and 8, Monongahela River

Public Law 99-662 authorizes the replacement of Locks 7 and 8 on the Monongahela River. Lock and Dam 7 will be replaced by a new lock and dam three miles downstream from the existing lock at Grays Landing, Penn., and renamed after that location. Lock 8, now called Point Marion, will be replaced on site and the existing dam will remain. Construction of both locks is an integral part of the plan of improvement of the Monongahela River to replace old and obsolete navigation facilities. Both locks are near the end of their economic life. Neither of these locks can economically pass the increasing volume of traffic or the larger tows presently on the river. Passage of larger tows through the locks requires separation into segments which necessitates two or more lockages. This breaking up of the tows results in costly delays as well as an increased chance for accidents. We are continuing engineering and design for these locks and land acquisition at Grays Landing.

### Grays Landing Lock and Dam, Monongahela River

The Grays Landing Lock and Dam project will consist of replacing the existing lock and fixed crest dam. The new lock will be 84-feet wide by 720-feet long. Our estimate to construct this project is $123 million.

### Point Marion Lock and Dam, Monongahela River

The Point Marion Lock and Dam project will consist of replacing the existing lock with a modern 84-foot-wide by 720-foot-long lock. The estimate for this project is $83 million.

### Gallipolis Locks and Dam, Ohio River

At Gallipolis Locks and Dam, Public Law 99-662 authorizes the construction of a new canal with main and auxiliary locks and rehabilitation of the existing dam. The act also provides that the 50 percent non-federal share of costs be obtained from waterway user fee receipts deposited in the Inland Waterways Trust Fund.

The canal will be located in West Virginia landward of the existing locks. It will be 1.7 miles long, have a minimum depth of 18 feet, and a minimum width of 500 feet. The main lock will be 110-feet wide by 1,200-feet long, and the auxiliary lock 110-feet wide by 600-feet long. Dam rehabilitation will consist of foundation anchorage, a bulkhead system, and replacement of the roller gates. The estimated cost is $336 million.

Acquisition of real estate was initiated in November 1985 and is scheduled for completion in September 1990. Plans and Specifications will be advertised for bids in July 1987 and a construction contract award is scheduled for October 1987.

### Winfield Locks and Dam, Kanawha River

Winfield Locks and Dam on the Kanawha River is the busiest on the Ohio River system in terms of lockages. This is caused by the limited capacity of its twin 56-foot-wide by 360-foot-long lock chambers. Last year, traffic here amounted to 15 million tons with most tows requiring two, three or four cuts to complete the locking process. Waiting time and lockage time together averaged nearly nine hours.

A new 110-foot-wide by 800-foot-long lock, at a total cost of $153 million would be authorized by Public Law 99-662 contingent upon approval by the Secretary. It would be added landward of the existing structure with one of the chambers to remain operational. Our feasibility report recommending construction of the lock is now being reviewed by the Board of Engineers for Rivers and Harbors.

Engineering and design and land acquisition were authorized by the 1985 Supplemental Appropriation Act, and the President's budget for Fiscal Year 1987 included $1.75 million for advance engineering and design. During Fiscal Year 1988 we plan to continue work on the general design memorandum, foundation investigations and model tests.

### Stonewall Jackson Lake, West Virginia

The contract for dam construction at Stonewall Jackson Lake in West Virginia, awarded in July 1983, has been completed. The $208 million project is 80 percent complete and is expected to be completed in September 1989. Available for full flood control storage, the reservoir is scheduled for permanent impoundment during the fall and the winter of 1987 and 1988.

### Yatesville Lake, Kentucky

A $24.6 million contract for construction of the remainder of the Yatesville Lake dam and outlet works in Kentucky was awarded on 23 April 1986 and the dam itself is now 36 percent complete. The overall project is 32 percent complete with total completion scheduled for September 1992.

### Williamson, West Virginia

Planning, design and construction of projects under Section 202 of Public Law 96-367 are well underway. The budget request of $14.4 million will be used in the Williamson, W.Va., area to continue real estate acquisition and construction of major project features.

Acquisition of real estate for the Central Business District flood protection project is also underway, as are engineering and design of the floodwall and pumping stations. Construction of the floodwall and pumping stations is scheduled to begin in February 1988 with completion in June 1992.

The pump station at West Williamson has been completed. Acquisition of real estate has been completed and construction of the floodwall was initiated in August 1986. Construction will continue in Fiscal Year 1988 and is scheduled for completion in September 1990.

Plans for the nonstructural measures have been completed. We are raising a number of homes above flood level in the project area. Utility relocations for the Valley View resettlement site are scheduled to begin this year and the site should be available for occupancy in the spring of 1988.

### South Williamson, Kentucky

The flood control project for South Williamson, Ky., was approved in June 1986 and will provide for a floodwall to protect the more densely developed areas and nonstructural measures for remaining areas.

A sheetpile cutoff wall was constructed as a part of the recently completed U.S. Route 119 highway fill and will serve as the upstream terminus of the structural project. The budget request of $700,000 will be used to continue detailed design of the floodwall.

Floodproofing of residential and nonresidential structures will begin the Spring of 1987.

### Matewan, West Virginia

The approved plan for Matewan, W.Va., provides for a mixture of structural and nonstructural measures. A combination fill/floodwall will provide Standard Project Flood protection for the Central Business District in a manner that will preserve the viability of this area and provide for restoration of business activities. Nonstructural measures will provide April 1977 flood protection for other project areas. Detailed planning is complete and implementation of nonstructural measures is underway. Our budget request provides $1.8 million for continuation of engineering and design for structural project features.

### Pineville, Kentucky

The joint federal/state flood protection and highway project at Pineville, Ky., is scheduled for completion in Fiscal Year 1988. This year's budget request of $8.55 million will be used to continue real estate acquisition and construction of levee/floodwall project features. In addition, an early action component of the nonstructural plan has been approved and acquisition of floodprone structures is complete.

### Barbourville, Kentucky

Construction of the Barbourville, Ky., high-flow diversion channel has been completed. The diversion has already demonstrated its usefulness by reducing both the February and the November 1986 floods by 2.5 feet. Engineering and design for the levee and wall modification to provide Standard Project Flood level of protection is nearing completion. Fiscal Year 1987 funds will be used to award a contract to initiate and complete construction of the Highway 459 bridge over Richland Creek.

### Harlan, Kentucky

The Fiscal Year 1987 Continuing Resolution provided funds in the amount of $3.6 million. The nonstructural part of the project has been approved and we are proceeding with detailed design of that work.

### Other 202 Studies

Work is progressing on the planning of other 202 studies at Kermit, W.Va.; Grundy, Va.; Williamsburg, Ky.; and other project locations. The budget contains $2.26 million for these other detailed studies. When a sufficient level of detail has been developed on these projects, we will initiate discussions with local officials to determine whether a non-federal cost share partner exists.

### Nonstructural Projects

The budget request contains $1.29 million for nonstructural measures at Williamson, Matewan, and Kermit, W.Va., and South Williamson, Ky.

### Southwestern Jefferson County, Kentucky

The Southwestern Jefferson County, Ky., project, located immediately downstream of Louisville, consists of over 13 miles of earth levee and concrete floodwall and four pumping stations. The $57.7 million project is 76 percent complete.

### Mill Creek, Ohio

The Mill Creek, Ohio, project, which extends through a highly-industrialized section of Cincinnati, is on schedule and is 29 percent complete. The $149 million project consists of 18 miles of channel improvements, two miles of levees, three pumping plants and modification of 51 bridges and utility crossings.

### Big South Fork National River and Recreation Area, Kentucky and Tennessee

The act creating the Big South Fork National River and Recreation Area, located in the rugged terrain of Kentucky and Tennessee, provided that the Corps of Engineers acquire, plan, and build the project and then transfer it to the National Park Service for operations and maintenance. I am happy to report that the Corps and National Park Service staffs are continuing a high level of cooperative effort in the planning, design, and resource management of this project.

We have now acquired 83,000 acres and have 20,000 acres remaining to be acquired in Fiscal Years 1987 and 1988. The National Park Service is managing these lands under the conditions of an Interim Management Agreement.

Last spring, we opened the Bandy Creek recreation site in Tennessee and turned it over to the Park Service. This fiscal year, we will complete the land acquisition and construction of Blue Heron campground, overlook, road and provide a river access development at the Leatherwood Ford River Crossing.

The $3.583 million requested in Fiscal Year 1988 will complete all scheduled work.

## MAJOR REHABILITATION AND DAM SAFETY ASSURANCE

The Major Rehabilitation Program permits construction of infrequent, costly structural rehabilitation or major replacement work intended to extend the useful life of projects. The Dam Safety Assurance Program provides for modifying completed Corps of Engineers dam projects which are potential safety hazards. Basically, this program has focused on upgrading structures that are either seismically or hydrologically deficient.

This budget includes funds for the continuation of rehabilitation work on Montgomery Locks and Dam on the Ohio River, and for several old dams on the Muskingum River. Funds are also included for continuation of dam safety work at the Mohawk Dam in Ohio.

| | Projects | |
|---|---|---|
| Rehabilitation | 2 | $10,000,000 |
| Dam Safety Assurance | 1 | 1,800,000 |
| TOTAL | | $11,800,000 |

### Montgomery Locks and Dam, Ohio River

The $7.7 million requested for rehabilitation work on Montgomery Locks and Dam will be used for new lock gates and for repairs to concrete, bulkheads, dam gates and other associated items. Work has been completed on the dam emergency bulkheads, the upper guard wall cells, and the 56-foot miter gates. The total cost to rehabilitate this project is $33.2 million. The project is scheduled for completion in March 1989.

### Muskingum River Basin

Through Fiscal Year 1986, we have spent over $19 million on engineering and construction work under our Major Rehabilitation Program. The 14 dams built between 1934 and 1938 in the Muskingum Basin have experienced downstream seepage, settlement of dikes, low spots on the rim, and potentially unstable dam slopes. All rehabilitation work has been completed on seven of these dams including Tappan, Leesville, Beach City, Clendening, Charles Mill, Senecaville, and Mohicanville. The estimated cost of the work to be funded from the Construction General appropriation is $25.3 million. Rehabilitation on the remaining seven dams is presently 77 percent complete. Final completion is scheduled for December 1988.

### Mohawk Dam, Ohio

Under the Dam Safety Assurance Program, a $7.8 million contract has been awarded for correcting a spillway deficiency problem at Mohawk Dam in Ohio. The work includes raising the earth dam, installing a concrete parapet wall on the upstream side of the crest, and widening the spillway width from 640 to 657 feet.

## OPERATIONS AND MAINTENANCE

The $159.377 million for the Operations and Maintenance Program is 56 percent of the total Ohio River Division budget.

Scope of Responsibility

| | |
|---|---|
| Locks | 61 |
| Waterways | 2,582 miles |
| Lakes & Reservoirs | 77 |
| Local Protection Projects | 7 |
| Hydropower | 9 |
| O&M BUDGET | $159,377,000 |

Because of advancing age and heavy usage, our projects are experiencing structural distress which requires increasing emphasis on their maintenance. We are dedicated to extending their usefulness by judicious use of limited resources. Operational demands continue to increase. Our navigation system handled over one quarter of the total inland waterway freight tonnage of the nation. We also operate an extensive network of flood control reservoirs and local protection projects, which annually prevent significant flood damages.

### Dashields Locks and Dam, Ohio River

Dashields Locks and Dam, located between Emsworth and Montgomery Locks and Dams on the upper Ohio River, is deteriorating from age and heavy use. This request includes $9.8 million for continuing its rehabilitation. We estimate total rehabilitation will require $26.7 million with planned completion in December 1989.

### Muskingum River Basin

Continued rehabilitation of the remaining projects in the Muskingum River Basin, now funded under the Operations and Maintenance appropriation, will require $3 million in Fiscal Year 1988. The estimated total cost for this work is $17.4 million.

## RECREATION

Our projects also provide recreational opportunities for the public. Over 100 million visitor days were logged at our 124 lakes and navigation pools during Calendar Year 1986. This is a 10 percent increase over 1985.

## FLOOD DAMAGE PREVENTION

The American people have invested $2.85 billion in the Ohio River Basin's 77 flood control reservoirs and 87 local flood protection projects. These projects have prevented nearly $9 billion in cumulative basin-wide flood damages, a return of approximately $3.15 for every $1.00 invested.

## EMERGENCY OPERATIONS

Fortunately, there were no major floods in the Ohio River Basin during Calendar Year 1986.

## SUMMARY

I want to conclude my testimony with a brief look at the impact of Public Law 99-662 on the Ohio River Division. As has been noted, the long-needed passage of a water resources omnibus bill cleared the way for a number of vital projects. This is especially true in the Ohio River Basin and I will touch on some of the highlights.

The bill authorizes four major lock and dam projects in the Ohio River Division with a total cost of nearly $700 million. It also establishes an Inland Waterways Users Board, an organization which should have a major impact on the future development of the inland waterways system.

It authorizes nearly $162 million of flood control projects, increases the program limits of small projects by $25 million and provides for additional work in water resources conservation and development.

The highly successful Summersville Lake releases for the whitewater recreation program are now authorized as a project purpose.

The new cost sharing provisions guarantee that non-federal interests will play an important role in planning, financing, and maintaining Corps of Engineers water projects. We think the work and cost sharing reforms authorized in Public Law 99-662 are very important to the economic life of this country. We are proud to have the opportunity to contribute to the development of the nation's water resources and this work.

We are committed to doing the very best we can in this effort. The needs of the people demand the most professional expertise we can provide.

NATIONAL ECONOMIC BENEFITS OF INLAND WATERWAY SYSTEM

Senator JOHNSTON. Thank you very much, Colonel Harrell.

Colonel, can you give the committee an idea of the national economic development benefits resulting from the inland waterway projects in your Division?

Colonel HARRELL. Yes, sir. According to the latest official data available—1984—the national economic development benefit from the inland waterway projects in the Ohio River Division is $2 billion.

Senator JOHNSTON. Colonel, the Corps is undertaking major rehabilitation work on several inland navigation facilities in the Ohio River Division. Briefly, how do you make the determination on rehabilitation versus replacement?

Colonel HARRELL. Basically, the replacement work that we are doing in the Ohio River Division is a result of the requirement for increased capacity. It is comforting to know that the structures that were placed into the system, many at the turn of the century, are still structurally sound because over the years, we have provided timely maintenance through major rehabilitation.

Senator JOHNSTON. Colonel, would you explain something? I noticed in one of the pictures what looked like crumbling concrete. Now, I have seen some concrete that was poured in the 1930's which is just as sound as it can be, and on some—for example, the bridges across the Potomac—have to be drilled out every few years because it is crumbling. What is it that makes concrete crumble like that?

Colonel HARRELL. Well, you have many things that will cause that to happen. One is weather, the exposure that these facilities go through every year. In our part of the country, the winters, some winters are very harsh; a lot of ice would adhere to these structures. Some of these old structures did not have the degree of reinforcement concrete that we are constructing with today. A lot of these structures have a large amount of concrete and very little steel in them, and so the combination of weather and of age over the years have caused what you saw in those pictures.

Senator JOHNSTON. Will all concrete eventually deteriorate?

Colonel HARRELL. I would say all concrete eventually will deteriorate, depending upon how long that period is.

Senator JOHNSTON. Senator Hatfield?

Senator Hatfield. I don't have any questions, Mr. Chairman.

Colonel Harrell, it is an excellent presentation, and I appreciate your appearance.

Senator JOHNSTON. Colonel Harrell, thank you very much. We are glad you appeared before the committee. We look forward to many years of your coming back. Thank you very much.

SUBMITTED QUESTIONS FOR THE RECORD

We have some questions in writing which we will submit to you for response. And I understand Senator Byrd and Senator Specter also have some questions. All of those will be placed in the record at this point.

Colonel HARRELL. Yes, sir.

[NOTE: The following questions were not asked, but were placed in the record for response by the Corps.]

## PREPARED QUESTIONS SUBMITTED BY SENATOR JOHNSTON

### CONSTRUCTION ACTIVITIES

Senator JOHNSTON. Colonel Harrell, the Ohio River Division program has been around $300 million a year for the past few years. What has been the average level of new work per year in the Ohio River Division?

Colonel HARRELL. Over these past few years, new work has represented 2 to 3 percent of our total yearly budget request.

Senator JOHNSTON. What new projects are proposed over the next few years and how will they impact your budget in future years?

Colonel HARRELL. Sir, our fiscal year 1988 budget request includes funds to continue preconstruction engineering and design of locks and dam 52 and 53 in Illinois and Kentucky, and Fairfield, Holes Creek, Logan, Nelsonville, and North Chillicothe, all in Ohio. These PED activities are currently scheduled for completion within the next 5 fiscal years and would be ready for construction. With the exception of locks and dam 52 and 53, local sponsors will be required to cost share these projects in accordance with the provisions of Public Law 99-662. These sponsors are aware of the cost-sharing requirements and have affirmed their intent through recent contact. We anticipate that these projects will not significantly impact our budget in future years because ongoing projects will be completed during this same timeframe.

### INLAND NAVIGATION PROJECTS

Senator JOHNSTON. The budget justification material indicates that a sizable portion of your program is directly related to the inland waterway system in the industrial Midwest. Now, what portion of this program is inland waterway related?

Colonel HARRELL. Of our $284.5 million budget request, $109.2 million, or 38.4 percent, is inland waterway navigation related.

Senator JOHNSTON. What is your assessment of the overall condition of the navigation facilities in your region?

Colonel HARRELL. Due to advancing age and heavy usage, many of our navigation projects are experiencing structural distress and reaching the end of their design life. This requires increasing emphasis on their maintenance and rehabilitation. We are pursuing modernization of our inland navigation system and continue to perform major rehabilitation efforts to extend project usefulness.

### REPLACEMENT AND MODERNIZATION OF INLAND NAVIGATION SYSTEM

Senator JOHNSTON. The Division has major modernization and replacement studies underway on the lower Kentucky River, the upper Ohio River and the upper and lower Monongahela River. Discuss how waterborne commerce volumes have changed over the past few years in the Ohio River Division. Could you provide for the record a table showing the actual tonnages through the various locks being studied for replacement and/or modernization for the past 10 years compared to that projected along with the projection for the next 5 years?

Colonel HARRELL. Detailed records of waterborne commerce in the Ohio River basin show a strong and consistent long-term growth trend, with only several short-term periods of traffic decline. Total traffic has grown from about 7 million tons in 1915, to about 166 million tons in 1970 and to nearly 202 million tons—about 53 billion ton-miles—in 1984. An annual tonnage decline was recently recorded over the entire inland waterway system, from a high in 1979 through a low in 1983, with a total decline for the Ohio River basin for this period, of about 9 percent. This short-term depressed traffic level, which reflected the national recessionary trend over the same time period, is now rapidly returning to the strong long-term growth trend for the Ohio River basin, a trend that is projected to continue well into the next century. Two factors need to be recognized in evaluating the requested data. First, the recent recession I just mentioned. When looking back over the considerable period of record available to us it is evident that these temporary downturns historically have not distorted the overall trend toward growth; however, these downturns, when viewed in isolation—as in the following table—give a distorted picture of overall productivity, expected growth and subsequent long-term demands on the navigation system. The second factor to be considered is the relatively rapid return to prerecession levels of traffic on the waterways. While undoubtedly some weakness in certain sectors of the economy remain, we are clearly returning to a period of growth in the basin. Coal remains a viable source of energy for the future in spite of temporarily weak oil prices. In fact, the high quality West Virginia coal and that of other basin states will insure energy support for a strong basin economy for many years to come.

TOTAL HISTORIC AND PROJECTED TONNAGES ON SELECTED PROJECTS

[In millions of tons]

| Lock and dam | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1992 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ohio River: | | | | | | | | | | | |
| Emsworth | 20.7 | 20.2 | 23.6 | 20.9 | 19.3 | 16.5 | 14.7 | 20.2 | 17.2 | 17.6 | 28.1 |
| Dashields | 21.1 | 20.4 | 24.4 | 22.0 | 21.2 | 16.9 | 14.5 | 20.7 | 17.9 | 18.6 | 29.3 |
| Montgomery | 18.8 | 19.2 | 24.0 | 21.5 | 22.2 | 18.2 | 16.0 | 21.5 | 19.0 | 20.1 | 29.3 |
| McAlpine | 41.9 | 43.5 | NA | 41.5 | 44.5 | 41.5 | 39.2 | 43.8 | 49.5 | 53.6 | 63.1 |
| L&D #52 | 62.5 | 64.2 | NA | 63.0 | 66.0 | 62.3 | 63.8 | 73.6 | 79.1 | 84.4 | 96.4 |
| L&D #53 | 54.8 | 54.7 | NA | 53.6 | 53.3 | 55.1 | NA | NA | NA[1] | NA | 82.8 |
| Kanawha River: | | | | | | | | | | | |
| Winfield | 7.0 | 8.4 | 12.7 | 13.4 | 12.9 | 13.7 | 13.7 | 15.3 | 15.7 | 17.8 | 19.4 |
| Marmet | 5.2 | 5.9 | 8.3 | 8.3 | 6.3 | 7.2 | 6.7 | 7.9 | 8.3 | 10.1 | 11.1 |
| London | 1.5 | 1.8 | 2.1 | 2.3 | 2.2 | 2.7 | 1.9 | 2.8 | 2.7 | 3.5 | 3.7 |
| Tennessee River: | | | | | | | | | | | |
| Kentucky | 19.1 | 22.6 | 24.5 | 25.2 | 20.8 | 20.4 | 24.4 | 26.7 | 25.6 | [2]21.1 | 46.8 |
| Monongahela River: | | | | | | | | | | | |
| L&D #2 | 17.4 | 17.2 | 21.1 | 19.4 | 19.2 | 16.0 | 12.8 | 17.5 | 15.3 | 15.9 | 25.0 |
| L&D #3 | 19.4 | 17.8 | 22.0 | 19.9 | 18.3 | 18.4 | 15.9 | 18.8 | 16.4 | 17.5 | 24.5 |
| L&D #4 | 14.8 | 13.1 | 18.1 | 17.0 | 15.5 | 16.8 | 13.9 | 16.4 | 14.3 | 16.0 | 21.0 |
| Kentucky River: | | | | | | | | | | | |
| L&D #1 | .5 | .4 | .4 | .3 | .2 | .2 | .1 | .2 | .2 | .2 | ......... |
| L&D #2 | .5 | .4 | .4 | .3 | .2 | .2 | .1 | .2 | .2 | .2 | ......... |
| L&D #3 | .5 | .4 | .4 | .3 | .2 | .2 | .1 | .2 | .2 | .2 | ......... |
| L&D #4 | .5 | .4 | .4 | .3 | .2 | .2 | .1 | .2 | .2 | .2 | ......... |

[1] Performance measurement system data are no longer being collected at this location.

[2] This value represents a 9-month period, due to a 3-month lock closure for rehabilitation. The estimated traffic diverted through Berkley during this 3-month period was about 8 million tons.

Senator JOHNSTON. How do your ongoing studies of the Ohio River navigation system compare to the conclusions in the National Waterways Study?

Colonel HARRELL. The National Waterways Study presented a framework for identifying waterway improvements that decisionmakers could utilize as a basis to aid in the scheduling of a comprehensive study program. Several important elements of this process, to name but a few, are: the analysis and incorporation of current traffic level data; a continuous updating and evaluation of traffic projections and needs; a consideration of environmental, social and cultural effects of the proposed project; a comprehensive economic analysis that demonstrates and supports the National Economic Development [NED] Plan; as well as an ongoing review of waterway investment priorities that are consistent with current policies of the Department, the President and the Congress.

The Corps waterway management program for the Ohio River basin is consistent with the National Waterways Study in that it is designed to assure that the basin's waterways will be capable of meeting both current and future traffic demands in a safe, timely and efficient manner. Toward this end, waterway improvement studies are underway or have been completed at the highest priority sites throughout the basin. The problems at most of these sites are related to the age and condition of the structures and to traffic congestion or bottlenecks at critical locations in the system: these are typically created by increased traffic and/or an inadequate lock size in relation to the normal configuration of a modern tow. For example, the antiquated locks and dams 52 and 53 on the lower Ohio River fail to meet contemporary design criteria and are located near a high potential earthquake zone. In addition, these projects will not meet future traffic demands. Systemwide Ohio River traffic is continuing its demonstrated long-term growth trend, a trend that is projected to continue well into the next century. At the same time, an evolution of towing equipment has resulted in more powerful, longer and wider barges, and the inclusion of more barges in each tow.

Navigation structures currently being studied for improvement include: Locks and dams 2, 3 and 4 on the lower Monongahela River; Emsworth, Dashields and Montgomery locks and dams on the upper Ohio River; Winfield, Marmet and London locks and dams on the Kanawha River; McAlpine lock and dam on the lower Ohio River; and the lock and channel problems in the lower reaches of the Cumberland and Tennessee Rivers.

Senator JOHNSTON. Do traffic projections currently support the replacement of Winfield lock and dam, locks and dams 7 and 8 and locks and dams 52 and 53?

Colonel HARRELL. Yes, sir.

### MAJOR REHABILITATION VERSUS REPLACEMENT

Senator JOHNSTON. How does a major rehab project extend the useful life of the facility?

Colonel HARRELL. Major rehabilitation extends a project's useful life by providing a safer and more efficient and economical facility until such time that a complete replacement can be constructed. Without major rehabilitation many projects would be forced to continue operation with only in-house maintenance and emergeny repairs without any planned major repairs or rehabilitation which could lead to project closure.

### STATION CAMP CREEK, KENTUCKY INTERIM STUDY

Senator JOHNSTON. Update the committee on the reconnaissance studies related to Station Camp Creek in Kentucky?

Colonel HARRELL. The study purposes of the Station Camp Creek interim study are flood control, water supply, hydropower, and recretion. The primary interest in the study is in determining the feasibility of a multipurpose lake. There is also interest in the water supply and flood control aspects of such a project.

Senator JOHNSTON. Do you feel that findings to date support proceeding with the feasibility studies?

Colonel HARRELL. Yes, sir. There is strong regional support and interest in the water supply and flood control aspects of this study.

Senator JOHNSTON. Do you believe that the project, which will emerge from the recon phase, can be supported by the administration?

Colonel HARRELL. Preliminary studies to date indicate a favorable recommendation in the reconnaissance phase and we are hopeful that local interests will agree to cost share a mutually agreed upon feasibility phase which would be supported by the administration.

Senator JOHNSTON. What specific indications does the Corps have that nonfederal interest will share in the cost of the feasibility study?

Colonel HARRELL. Local interests have not yet agreed to cost share this study. Upon completion of a favorable recommendation in the reconnaissance phase, local interests would be required to cost share the feasibility phase of the study. It is anticipated that Estill County, Ky., in conjunction with several counties and communities in the region, will act as local sponsors and provide cost sharing for a mutually agreed upon feasibility phase. Through the Bluegrass Area Development District, additional support and sponsorship is expected to be developed with adjacent counties and communities, including Fayette County and the city of Lexington.

## GRANDVIEW HEIGHTS, OHIO INTERIM STUDY

Senator JOHNSTON. Do the results of the reconnaissance study to date clearly support moving into the feasibility phase?

Colonel HARRELL. Yes, we believe progress to date supports initiating the feasibility phase of this study in fiscal year 1988.

Senator JOHNSTON. Do you believe that the recon study will produce a project that can be supported by the administration?

Colonel HARRELL. Yes, sir.

Senator JOHNSTON. What specific evidence does the Corps have to indicate that the nonfederal interest will share in the cost of the feasibility study?

Colonel HARRELL. The city of Grandview Heights requested that the Corps of Engineers proceed with studies to determine the feasibility of implementing flood damage reduction measures in the vicinity of Grandview Heights. The city conditionally agreed by letter dated May 2, 1983, to act as the local sponsor and furnish certain items of local cooperation in the event that a feasible plan is identified and recommended for construction. A cost-sharing agreement for the feasibility phase will be negotiated after completion of the reconnaissance report.

## BIG SOUTH FORK NATIONAL RIVER AND RECREATION AREA

Senator JOHNSTON. The Water Resources Development Act of 1986 raised the estimated project cost by $52.6 million to $156,122,000. What does the additional $52.6 million provide for?

Colonel HARRELL. Additional work would consist of land acquisition, design and construction of additional roads and bridges, and recreation facilities consisting of some canoe accesses, lodges, campgrounds, and administrative and maintenance facilities as contained in the Big South Fork master plan.

Senator JOHNSTON. When were funds first appropriated to initiate construction and when was land first acquired?

Colonel HARRELL. Funds to initiate construction were first appropriated in fiscal year 1979. We acquired the first land in the same fiscal year.

Senator JOHNSTON. Are the cost increases shown in the justification material the result of inflation or has there been an expansion of the original development plan?

Colonel HARRELL. The $52.6 cost increase reflects the next phase of the original master development plan which consists of acquiring additional land, constructing additional roads and bridges, recreation facilities and lodges.

## NEWARK, OHIO

Senator JOHNSTON. I note that only $300,000 of the $2.5 million appropriated for the Newark, Ohio, local protection project was actually allocated as planned. What problems have you been experiencing on this project?

Colonel HARRELL. Delay in completing rights-of-way acquisition and necessary relocations work by the city of Newark resulted in separation of the North Fork Channel work into two phases with consequent reduction in fiscal year 1987 funds requirement and delay in completion date. Phase I awarded in fiscal year 1986 is complete. Phase II is scheduled for award in June 1987.

Senator JOHNSTON. What makes you think you'll be able to fully utilize the $2.4 million requested for 1988 in light of past performance?

Colonel HARRELL. Phase II of the North Fork Channel is scheduled for award in June 1987 and we anticipate full utilization of the requested $2.4 million.

## HARLAN, KY.

Senator JOHNSTON. How is the Corps using the $3.6 million appropriated for Harlan, Ky., in 1987?

Colonel HARRELL. The $3.6 million made available for the Harlan project in fiscal year 1987 will be utilized to initiate the design and implementation of the more critical nonstructural measures for this project. After approval of the structural project report, fiscal year 1987 funds will be used for design, real estate acquisition, and construction of a road relocation.

Senator JOHNSTON. What is your capability on the Harlan portion of the project and how will the funds be used?

Colonel HARRELL. For Harlan, there are no funds included in the fiscal year 1988 budget, and we have not established a capability. This project not only lacks the normal economic justification which typified Corps projects, but also is not subject to the discipline of cost sharing.

### SECTION 202 PROGRAM

Senator JOHNSTON. Congress provided specific appropriations for various parts of the Tug and Levisa Forks project. Is the Corps proceeding as envisioned on the project in the current year? If not, please explain.

Colonel HARRELL. Yes sir; funds in the amount of $27,185,000 were provided for the section 202 program. Within these funds, $1.1 million and $3.6 million were appropriated in the act to initiate construction of the Barbourville and Harlan, Ky., elements, respectively. These funds will be used to fully fund complete items of work at full federal expense.

Senator JOHNSTON. Provide for the record a breakout of your capability for each portion of the section 202 project.

Colonel HARRELL. Although project and study capabilities reflect the readiness of the work for accomplishment, they are in competition for available funds and manpower Army-wide. In this context, the fiscal year 1988 capability amounts shown consider each project or study by itself without reference to the rest of the program. However, it is emphasized that the total amount proposed for the Army's Civil Works Program in the President's budget for fiscal year 1988 is the appropriate amount consistent with the administration's assessment of national priorities for federal investments and the objectives of avoiding large budget deficits and the serious adverse effect that government borrowing is having on the national economy. Therefore, while we could utilize additional funds on individual projects and studies, offsetting reductions would be required in order to maintain our overall budgetary objectives.

| Element | Budget request | Capability |
|---|---|---|
| Williamson, W. Va | $14,400,000 | $14,400,000 |
| Matewan, W. Va | 1,800,000 | 1,800,000 |
| South Williamson, Ky | 700,000 | 1,350,000 |
| Pineville, Ky | 8,550,000 | 8,550,000 |
| Other detailed studies | 2,260,000 | 2,260,000 |
| Nonstructural | 1,290,000 | 1,290,000 |
| Barbourville, Ky |  | Not established |
| Harlan, Ky |  | Not established |
| Total | 29,000,000 | 29,650,000 |

## PREPARED QUESTIONS SUBMITTED BY SENATOR BYRD

### GRAYS LANDING AND OTHER LOCKS AND DAMS

*Question.* The President has requested $3.3 million for continued real estate acquisition and planning and design of the replacement for lock and dam 7 at Grays Landing on the Monongahela River. It is my understanding that an additional $3.5 million could be used in fiscal year 1988 to initiate construction on the replacement facilities. By how many months would the project schedule be advanced and exactly what would be accomplished with these funds next year?

Answer. The additional capability of $3.5 million would allow us to award the contract for the right bank excavation 6 months earlier.

*Question.* Would you provide for the record a detailed project schedule which assumes the availability of these additional funds?

Answer. Assuming receipt of the total $6.8 million in fiscal year 1988 and the necessary funding beyond this, the following tentative schedule could be maintained:

| Major activities | Initiate construction | Complete construction |
|---|---|---|
| Bank excavation | April 1988 | Sept. 1989 |
| Lock construction | Feb. 1990 | Jan. 1993 |
| Stage I dam construction | Feb. 1993 | June 1994 |
| Stage II dam construction | July 1994 | June 1995 |

*Question.* What are your additional construction capabilities, over the budget request, for lock and dam 8, Winfield, and Gallipolis?

Answer. We do not have any additional capability over the budget request for these projects. The total fiscal year 1988 capabilities are $1.1 million for lock and dam 8, $1,750,000 for Winfield and $8 million for Gallipolis.

*Question.* Please provide for the record detailed schedules on these projects and indicate the impact any additional funding may have.

Answer. The following optimum schedules are provided for these projects:

| Project/activity | Initiate | Complete |
|---|---|---|
| Lock and dam 8: | | |
| Lock design memorandum | March 1987 | Nov. 1988 |
| Foundation design memorandum | March 1987 | March 1988 |
| Real estate design memorandum | Oct. 1987 | July 1988 |
| Lock plans and specifications | May 1988 | Nov. 1989 |
| Land acquisition | June 1988 | Dec. 1989 |
| Lock construction | Feb. 1990 | Jan. 1993 |
| Close existing lock | Jan. 1993 | Oct. 1993 |
| Winfield locks and dam: | | |
| General design memorandum | Oct. 1987 | July 1988 |
| Feature design memorandum | Oct. 1988 | June 1990 |
| Plans and specifications | April 1990 | Jan. 1993 |
| Land acquisition | Oct. 1989 | Sept. 1992 |
| Lock construction | July 1993 | June 1996 |
| Gallipolis locks and dam: | | |
| Acquire real estate | Oct. 1985 | Feb. 1987 |
| Canal and locks plans and specifications | July 1985 | July 1987 |
| Construct canal and locks | Nov. 1987 | Sept. 1991 |
| Acquire F&W mitigation lands | April 1987 | Sept. 1990 |
| Dam rehabilitation plans and specifications | July 1989 | June 1992 |
| Rehabilitate dam | July 1992 | July 1995 |

The above schedules are predicated on the budget request for fiscal year 1988 and assumes that all funding beyond that year would be available as needed.

## TUG FORK

*Question.* The fiscal year 1988 request includes $29 million for section 202 projects. Several project activities in Williamson and Matewan, W. Va., have slipped on the completion schedule. For example, the completion dates for relocations and lands and damages in the Matewan area have slipped by 24 and 21 months respectively, compared to the dates given in the fiscal year 1987 budget justification. The completion date for relocations in the Williamson area has slipped by 15 months. What are the reasons for these slippages, and what can be done to restore the previous project schedule for these activities?

Answer. Detailed planning and engineering studies for Matewan dictated a change in the schedule. This change was made to avoid a major problem with displacement of existing residents from the project area. A portion of the project involves the construction of earth and rock fill upon which flood-safe residential development can be placed. The development would entail resettlement of existing flood-prone families in the area including those currently living within the construction work limits who wish to relocate back into their original neighborhood. In order to accommodate the variety of specific relocation needs of this group of residents, we must defer portions of the project real estate acquisitions until replacement housing can be made available for use during construction of the Matewan fill. This requirement caused the extension in the relocations and lands and damages schedules.

The estimates for both costs and time required for relocations work in the Williamson area have increased from last year. These increases primarily result from the adoption of necessary measures, such as construction of temporary railroad runarounds, to prevent disruption of rail traffic during the construction of gate closures in the floodwall. This is the reason for this 15-month slippage in the relocations feature at Williamson.

We are clearly aware of the need to expedite project completion. Consequently, we are continuing to review project sequencing as the detailed design progresses with the hope that we can make improvements.

### SECTION 202 CAPABILITIES

*Question.* What additional funding capabilities do you have for the section 202 project and what would be the impact of these funds on the project schedules?

Answer. The fiscal year 1988 capability for section 202 is $29,650,000 which is an additional $650,000 above the budget request of $29 million. These additional funds would be applied to additional nonstructural measures at South Williamson, Ky. The additional funds would not advance project completion but would allow for a larger construction package to be advertised with the hope that the unit costs would be lower resulting in a savings in construction costs.

### NOVEMBER 1985 FLOOD

*Question.* What is the status of the Corps' flood protection reconnaissance studies on the Cheat River and especially in the Parsons, W. Va., area?

Answer. An initial appraisal of the flooding problems at Parsons and vicinity was completed in October 1986 using the section 205 authority. A channel improvement project to reduce flood damages at Parsons was analyzed in preliminary detail and found to have possibilities for a project. Reconnaissance level studies have been initiated and will be completed in early fiscal year 1988.

*Question.* Are this and other flood-related studies elsewhere in West Virginia fully funded? If not, please elaborate on what additional funds could be used and indicate what additional activities would be undertaken?

Answer. Other communities in the Monongahela and Cheat basins that were flooded in November 1985, are being examined as part of a screening process that is currently underway and scheduled for completion in February 1987. The flooding problems at Rowlesburg and nearby Cheat River communities will be addressed through a restudy of the authorized Rowlesburg Lake project. Funds for this restudy have not yet been appropriated. We have a fiscal year 1988 capability of $500,000 to initiate preconstruction engineering and design of the Rowlesburg Lake project.

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## PREPARED QUESTIONS SUBMITTED BY SENATOR SPECTER

*Question.* The joint explanatory statement of the Water Resources Development Act of 1986 provides that "project priorities should be based on combination of factors such as benefit to the nation, environmental and economic values, economic equity and need." I am concerned about that progress being made with locks and dams 7 and 8, and the Gallipolis lock and dam. You testify that locks and dams 7 and 8 are now undergoing engineering and design and land acquisition. Specifically, how much progress has the Corps made on engineering and design of locks and dams 7 and 8 and when, in your view, will the plans be completed.

Answer. To date on lock and dam 7, the general design memorandum, the feature design memorandum on right bank excavation, and the feature design memorandum for lock and dam site real estate have been prepared and approved. Work has been initiated on land acquisition and on preparing feature design memorandum for the lock and dam and relocations. In fiscal year 1987, we will continue acquiring land at the site, complete the feature design memorandum for the lock and dam, initiate and complete the feature design memorandum's for concrete aggregate sources and for real estate in the pool area, continue the relocations feature design memorandum, and initiate and complete plans and specifications for the bank excavation.

To date on lock and dam 8, the district has essentially completed extensive hydraulic model testing for the project and has completed geotechnical exploration and testing. During fiscal year 1987, we will complete the general design memorandum and work on the feature design memorandums for the lock and for foundations.

*Question.* In addition, what is the status of acquiring land for each project?

Answer. On lock and dam 7, a field office was opened on October 1, 1986, and land acquisition has begun. On lock and dam 8, real estate planning activities are ongoing with land acquisition currently scheduled to begin in fiscal year 1989.

*Question.* Finally, what estimate would you give on when the replacement of these locks will begin?

Answer. Our present schedules for both locks and dam 7 and 8 do not show construction starts. However, engineering and design for the initial construction contracts for locks and dam 7 and 8 are scheduled to be completed by October 1987 and January 1990, respectively, at which time these projects will be considered for construction.

### GALLIPOLIS LOCKS AND DAM

*Question.* With regard to the Gallipolis locks and dam plan, please advise me of the anticipated construction schedule and a projection of when land acquisition will be completed.

Answer. It is anticipated that construction will be initiated in October 1987 with award of a contract for the canal and the locks. Land acquisition has been completed and land is available for all construction activities. Acquisition of the lands required for fish and wildlife migration will be initiated this fiscal year and completed in fiscal year 1990.

## MISSOURI RIVER DIVISION

## STATEMENT OF BRIG. GEN. CHARLES E. DOMINY, DIVISION ENGINEER

**ACCOMPANIED BY:**

**JOHN VELEHRADSKY, CHIEF, PLANNING DIVISION**
**WILLIAM TODSEN, CHIEF, ENGINEERING DIVISION**
**ROBERT SCOTT, CHIEF, PROGRAMS MANAGEMENT OFFICE**

Senator JOHNSTON. Next, we are happy to welcome Brig. Gen. Charles E. Dominy, Division Engineer of the Missouri River Division.

General, welcome.

General DOMINY. Thank you, Mr. Chairman and distinguished members of the committee. I am Brig. Gen. Charles E. Dominy, and I am privileged to report on the civil works activities of the Missouri River Division and to present the Division's fiscal year 1988 program request for your consideration.

Accompanying members of my staff are John Velehradsky, Chief of Planning; William Todsen, Chief of engineering; and Robert Scott, Chief of Programs Management Office.

### PREPARED STATEMENT

I would like to submit my prepared status report for the record an to present a brief oral summary.

Senator JOHNSTON. Without objection, so ordered.

[The statement follows:]

## STATEMENT OF BRIG. GEN. CHARLES E. DOMINY

Mr. Chairman, distinguished members of the Committee, I am Brigadier General Charles E. Dominy. I am privileged to report on the civil works activities of the Missouri River Division and to present the Division's FY 88 program request for your consideration.

Accompanying members of my staff are John Velehradsky, Chief of Planning; William Todsen, Chief of Engineering; and Robert Scott, Chief of Programs Management Office.

The Missouri River Division civil works boundary encompasses all of Nebraska and parts of nine other states.

### MISSOURI RIVER BASIN

Missouri River basin runoff upstream from Sioux City, Iowa, totaled 36.3 million acre-feet (MAF) in 1986, 11.3 MAF above normal and the third highest in 89 years of record. Currently the high mountain snowpack is only 70 percent of normal above Fort Peck Lake, Montana, and 85 percent of normal in the drainage area upstream from Garrison Dam in North Dakota. The plains snowpack started accumulating early in November but has been depleted by the mild and dry weather experienced during December. We are currently forecasting the 1987 calendar year runoff in the basin upstream from Sioux City will be 24.5 MAF, or about 0.5 MAF below the long term average.

Our Main Stem Missouri River reservoir operations in the upper basin were influenced by two major flood events over the Milk River basin in Montana.

Extreme and unusually warm temperatures over the upper basin in late February caused a rapid melt of the plains snowpack. Because the melt occurred over frozen ground, the magnitude and peaking time of the runoff was much greater and faster than would normally be expected. As a result, runoff into the reservoirs formed by Garrison Dam in North Dakota and Oahe Dam in South Dakota during March was the second and third highest, respectively, since record keeping began in 1898. In a 21-day period, the six main stem dams gained over 4.3 MAF of storage and the runoff caused many of the tributary streams and rivers in Montana and North Dakota to rise to stages near the record levels set in 1952. The Milk River near Nashua, Montana, crested on March 8 at more than 10 feet above flood stage and only 1.3 feet below the record level set in the 1952 flood. The Heart River at Mandan, North Dakota, crested on March 4 at more than 7 feet above flood stage and 1.5 feet below the record set in 1952. Releases from Fort Peck were reduced to a minimum which resulted in an 11 foot stage reduction at Wolf Point, Montana, the first community located on the Missouri downstream of the reservoir. Farther downstream on the Missouri River below Garrison reservoir the stage at Bismarck, North Dakota, was reduced by 5.4 feet.

Once again heavy rainfall in the amount of 7-8 inches fell in the Milk River basin, Montana during a 24-hour period on 24-25 September 1986. As a result of this extremely heavy rainfall over much of central Montana, inflows to Fort Peck increased from 8,000 cfs on September 24 to a record 150,000 cfs on the next day, which was the highest daily inflow ever recorded into Fort Peck. As the flood flows from the Milk River reached the Missouri, daily releases from Fort Peck were reduced to as low as 2,900 cfs, resulting in complete elimination of flooding along the Missouri in the upper basin. Fort Peck and Garrison reservoirs prevented over $15 million in damages along the upper

Missouri at the communities of Wolf Point and Culbertson, Montana, and Bismarck, North Dakota, during this single event.

Unusual floods also occurred in the lower Missouri River basin, particularly in the Osage River basin. During the week of September 29 to October 6, heavy rainfall occurred after two to three weeks of rainfall in the same general area that had already raised the Missouri River to near or above flood stage from just below Kansas City, to the mouth at St. Louis.

During this critical week, the six Corps Reservoirs in the Osage River basin stored nearly 4 MAF of flood waters, with a major portion of this volume stored in Harry S. Truman Lake. In fact, on October 3, Truman Lake inflow was about 445,000 cubic feet per second. Immediately downstream at the Lake of the Ozarks, a privately owned hydroelectric project formed by Bagnell Dam, extremely high inflows on October 3 caused the pool to rise to within six feet of the top of the dam even though there were no releases from Truman Dam from September 30 to October 5. This is the third highest pool level reached at Bagnell Dam since operation began in 1931. Without upstream flood control storage by the Corps lakes in the Osage River basin, the elevation of the Lake of the Ozarks would have exceeded all past record floods and Bagnell Dam would have been overtopped. Although the dam has been structurally modified to withstand overtopping, the powerhouse would have been flooded, resulting in substantial damage and loss of generation capability, and approximately $60 million damage to private structures along the lake would have occurred. The flow below Bagnell Dam would have exceeded 200,000 cfs for several days, a rate more than double the 98,000 cfs actually released during a two-day period. Again, this occurred at a time when there were no discharges from Truman.

Further effectiveness of the operation of the flood control projects in the Osage River basin is demonstrated by stage hydrographs at St. Thomas, Missouri, a gaging station on the Osage River about 40 miles downstream from Bagnell Dam. The actual flood crested late on October 4, at 10.4 feet above flood stage. Without any upstream regulation, the crest would have been nearly 17 ft. higher. A preliminary estimate of the damages prevented by our projects, primarily Harry S. Truman, during this flood event is $270 million.

This flood event caused severe damage to private levees on both the Osage River and lower Missouri River. We have approved repair of 13 levee projects and have received another 70 requests. Even with the required cost-sharing of 20 percent, we expect that the Federal cost of levee repairs will be about $3 million.

Our projects continue to prove a sound investment in the Missouri River basin. Through FY 86, which excludes the floods in the lower basin during FY 87, projects in the Missouri River basin have prevented over $8.6 billion in flood damages.

## FY 1988 PROGRAM REQUEST

The Missouri River Division program request for FY 88 is $102.5 million. This request is distributed as follows: 2 percent for investigations, 17 percent for construction, and 81 percent for operation and maintenance.

## GENERAL INVESTIGATIONS

The funds requested for General Investigations will be applied to flood damage prevention studies. These funds will be used to start one new study, continue six cost-shared studies and continue preconstruction engineering and design on two projects.

## GRAND RIVER BASIN, MISSOURI AND IOWA

The FY 88 program includes $310,000 for Reconnaissance Study of the Grand River basin in Missouri and Iowa. The Grand River is a left bank tributary of the Missouri River, draining an area of 7,900 square miles in north-central Missouri and southern Iowa. An authorized plan of improvement consisting of five lakes and levee and channel improvements is no longer economically feasible. This study would reexamine the basin to identify projects in which there may be a Federal interest.

## BLUE RIVER BASIN, KANSAS AND MISSOURI

The reconnaissance study on the Blue River basin is nearing completion with available funds. The basin lies within the urbanized area of metropolitan Kansas City. A construction project on the lower end of the Blue River is underway; however, serious flooding problems remain upstream. Potential solutions to these problems include channel modifications, levees, and non-structural measures. The program request of $135,000 will provide the FY 88 Federal share of the follow-on feasibility study, scheduled for completion in September 1989.

## TURKEY CREEK BASIN, KANSAS AND MISSOURI

The Turkey Creek basin is a 23-square- mile area within Kansas City, Kansas and suburbs in Johnson and Wyandotte Counties. The basin is nearly 100 percent urbanized, with a significant amount of development existing in the flood plain. Large floods cause overbank flows to inundate highly developed areas in the Central Industrial District in Kansas City, Missouri, as well as in Kansas City, Kansas. The most recent flood occurred in September 1986. Both the cities of Kansas City, Kansas, and Kansas City, Missouri, support the study. The program request for FY 88 of $200,000 will be used to initiate feasibility studies.

## OSAGE RIVER BASIN, MISSOURI ABOVE HARRY S. TRUMAN DAM

The study area of the Osage River basin, Missouri, above Harry S. Truman Dam comprises about 40 percent of the 15,300-square-mile Osage River basin. The state of Missouri is the non-Federal sponsor and is providing one-half of the study costs incurred subsequent to 15 March 1986. In order to accommodate the sponsor's funding capability, the completion of the study has been rescheduled to September 1991. The program for FY 88 is $80,000.

## ST. JOSEPH, MISSOURI AND VICINITY

The study of St. Joseph, Missouri, and vicinity addresses the substantial flood hazard from several small tributary streams which flow through or near the city. Portions of the city are protected from Missouri River flooding by Federally constructed levees. The most recent flooding occurred on 7 June 1984 and resulted in one death and severe monetary losses. The reconnaissance study is scheduled to be completed in December 1987. The program request of $150,000 for FY 88 will be used for the Federal share of the feasibility study to be initiated in FY 88.

## PLATTE RIVER BASIN, COLORADO, NEBRASKA, AND WYOMING

The basin-wide reconnaissance study of the Platte River basin, Colorado, Nebraska, and Wyoming is scheduled to be completed in May 1987. The preliminary results of the reconnaissance study have identified flood problems which may warrant additional reconnaissance and more detailed feasibility studies. The Urban Drainage and Flood Control District is the sponsor in the Denver Metropolitan area. The program request of $80,000 for FY 88 will be used for the initial Federal share of the feasibility study on Ralston and Leyden Creeks in the Denver metropolitan area. This study is scheduled for completion in April 1990.

## WATERTOWN AND VICINITY, SOUTH DAKOTA

The Watertown and Vicinity, South Dakota study area consists of that part of South Dakota in the Big Sioux River basin above the Brookings-Moody county line. The Big Sioux River and the natural lakes in the valley are generally interconnected with surficial aquifers which are experiencing prolonged high water conditions. Lakeside developments and the towns of Watertown, Castlewood, Estelline, Bruce, and Brookings have experienced damages due to peak flood discharges. The reconnaissance study was funded under the Eastern Dakota and Upper Big Sioux River study. I anticipate starting the cost-shared feasibility study in late FY 87. The program request for FY 88 of $175,000 will be used to continue the feasibility study.

## PERRY CREEK, IOWA

Funds in the amount of $174,000 are requested for preconstruction engineering and design for the Perry Creek

Project in Sioux City, Iowa. The project, authorized by the Water Resources Development Act of 1986, consists of channel improvements and reconstruction of about 4,000 feet of existing conduit. In FY 87, the General Design Memorandum will be completed and design model studies initiated. FY 88 funds will be used for completion of the design model studies and to design the conduit.

### BRUSH CREEK, KANSAS CITY, MISSOURI

Preconstruction engineering and design funds of $350,000 are also requested for the Brush Creek Project, Kansas City, Missouri, which was authorized by the Water Resources Development Act of 1986. The plan of improvement consists of deepening the channel an average of five feet, from downstream of Roanoke Road for approximately 7,500 feet to just below Troost Avenue. Kansas City, Missouri, the local sponsor, has proposed extending the project both upstream and downstream at local cost to further reduce flood damages in the Brush Creek basin. Funds requested for FY 88 will be used to complete the General Design Memorandum and start the preparation of plans and specifications.

### CONSTRUCTION, GENERAL

The request of $17.7 million for Construction, General will be used to start construction on one project and continue construction on seven projects.

### WESTERLY CREEK, COLORADO

Funds are requested in FY 88 to start construction of the Westerly Creek Project, Colorado. The Westerly Creek basin is located in the metropolitan Denver area. The proposed project consists of modification of Kelly Road Dam, construction of Upper Lowry Dam, and construction of two drainage channels into Upper Lowry Dam. The project is located within Lowry Air Force Base.

The local sponsor will be the Urban Drainage and Flood Control District No. 69. The program request of $700,000 will be used to start relocations required for the Upper Lowry Dam on Lowry Air Force Base.

## CHATFIELD LAKE, COLORADO

Chatfield Lake project near Denver is complete except for downstream channel improvements. Program requirements of $300,000 for FY 88 will be used to complete downstream channel construction and continue construction of recreational facilities along the downstream channel.

## MISSOURI RIVER LEVEE SYSTEM
## IOWA, NEBRASKA, KANSAS, AND MISSOURI

The Missouri River Levee System has a total Federal and non-Federal investment of $98.5 million through FY 86. This investment prevented an estimated $267 million in flood damages.

The program request of $1.5 million will be used on several activities. On the recently completed Unit L 246, extensive slides have occurred on the Lower Chariton River tieback and main stem levees. Funds requested for FY 88 will be used to complete the design and start the rehabilitation of these levees. Also, in FY 88 we will start the restudy of completed units, continue planning on two active units, and continue the review of deferred and inactive units.

## BLUE RIVER CHANNEL, KANSAS CITY, MISSOURI

Scheduled construction of Stages 1 and 2 for the Blue River Channel project in Kansas City, Missouri, is now 21 percent complete. Current year funds are being used to continue railroad relocations and to complete existing channel contracts.

Last year I reported that the cost estimate for this project increased about $5 million for design changes to the remaining work in this phase resulting from unstable bank conditions detected during construction. Additional analysis indicates that the preliminary estimate of work is inadequate to control the highly unstable material. Additional construction will be necessary to avoid major slides in the tightly congested industrial areas. Work consists of constructing multiple rows of H-piling spaced a few feet apart to pin the unstable riverbanks prior to enlarging the Blue River channel. This increased the cost estimate for the remaining work in Stages 1 and 2 an additional $17.5 million. The time required to complete the redesign and the need to stage the follow-on construction will result in an additional two years to complete Stages 1 and 2.

The $3.8 million requested for FY 88 will be used to complete railroad relocations required for Stages 1 and 2 as well as to continue construction of Stage 2 channel.

## LITTLE BLUE RIVER LAKES, MISSOURI

The Little Blue River Lakes Project consists of Longview and Blue Springs dams. Longview dam is complete. Diversion of flows through the outlet works of Blue Springs dam was accomplished last August. Shortly after, a severe flood occurred in the basin which nearly overtopped the cofferdam which protected the dam closure section. In an around-the-clock operation, office and field forces of our Kansas City District protected the cofferdam slopes with filter cloth. Above normal rainfall and the flood operations prevented raising the embankment to the required height prior to winter. As a result, completion of the embankment and the entire project will be delayed one year. The request of $2.6 million for FY 88 will be used to continue construction of the Blue Springs dam and service roads as well as recreational facilities at both lakes.

## MISSOURI NATIONAL RECREATIONAL RIVER
## NEBRASKA AND SOUTH DAKOTA

The Missouri National Recreational River project was authorized by Section 707 of the National Parks and Recreation Act of 1978. The project was funded for new start construction in the FY 85 Supplemental Appropriation Act. That Act also required cost-sharing under terms and conditions acceptable to the Secretary of the Army. These terms are essentially the same as provided by the Water Resources Development Act of 1986. A small recreation cost-sharing contract for construction of a boat ramp was negotiated in 1986. The request for FY 88 will be used to identify additional separable elements which could be justified under current cost-sharing criteria.

## PAPILLION CREEK AND TRIBUTARIES LAKES, NEBRASKA

The scheduled Papillion Creek and Tributaries Lakes project in Nebraska consists of the construction of four dams -- Sites 11, 16, 18 and 20 -- and the restudy of remaining flood problems in the basin. Sites 11 and 16 are complete and fully operational.

At Site 20, the dam and relocations are complete. Cost-shared recreation facilities will be completed in FY 88.

The dam and relocations are also complete at Site 18, and the dam is capable of performing its flood control function. Public Law 99-591 directed the Corps to resolve a potential water pollution problem by diverting treated effluent from two sewage treatment plants into one or two holding basins. This new effort will be cost-shared with local interest who will be responsible for its design, construction and operation. The FY 88 program will be used to complete work on the effluent storage work and initiate recreation facilities.

Public Law 99-591 and the Water Resources Development Act of 1986 authorized the construction of channel and railroad bridge improvements on the Big Papillion Creek between West Center Road and L Street in Omaha, with a recreation trail located within the right-of-way, and a basin-wide flood warning system. Funds requested for FY 88 will be used to initiate Preconstruction Engineering and Design.

These activities will require a total of $2.5 million in FY 88.

## HARRY S. TRUMAN DAM AND RESERVOIR, MISSOURI

The Harry S. Truman Lake project in Missouri is regulated to achieve the purposes of flood control, hydropower, recreation, and fish and wildlife.

The $6.2 million requested for FY 88 will be used principally to continue procurement of intake gates and hoists for the power plant. The remaining funds will be used for miscellaneous expenses such as relocation of roads and municipal facilities, outlet channel erosion protection, and the construction of a satellite maintenance building.

OPERATION AND MAINTENANCE

Our Operation and Maintenance program for FY 88 is $83.1 million.

Of the requested amount, $9.7 million, or 12 percent, will be used to maintain the 732-mile-long Missouri River navigation and bank stabilization project; $23.9 million, or 29 percent, will provide for operation and maintenance of our flood control facilities; $45.8 million, or 55 percent, will be used for operation and maintenance of our 8 multi-purpose power projects; and $3.7 million, or 4 percent, will be used for regulatory activities.

Mr. Chairman, this completes my report.

## AREA OF RESPONSIBILITY

General DOMINY. The Missouri River Division civil works boundary encompasses all of Nebraska and parts of nine other states, approximately 529,000 square miles of area.

I want to begin today with a quick summary of major flooding which occurred in the basin in 1986.

## 1986 FLOODING

Missouri River basin runoff upstream from Sioux City, Iowa, totaled 36.3 million acre-feet in 1986, 11.3 million acre-feet above normal, and the third highest in 89 years of record.

Our main stem Missouri River reservoir operations in the upper basin were influenced by two major flood events over the Milk River basin in Montana. Flood stages in March along the Milk River were only 1.3 feet below the record set in 1952. Heavy rains in September created additional flooding, but the impact was reduced significantly by holding back releases from main stem reservoirs. Approximately $15 million in flood damage was prevented in Montana and North Dakota.

Unusual floods also occurred in the lower Missouri River basin, particularly in the Osage River basin. During the week of September 29 to October 6, heavy rainfall occurred in a region already saturated by earlier rainfall, which had raised the Missouri River to near or above flood stage from just below Kansas City to the mouth at St. Louis.

During this critical week, the six Corps reservoirs in the Osage River basin stored nearly 4 million acre-feet of flood waters, with a major portion of this volume stored in Harry S. Truman Lake. This upstream flood control storage by the Corps lakes was vital to the privately owned Lake of the Ozarks Bagnell Dam which would have been overtopped, their powerhouse would have been flooded, and approximately $60 million damage to private structures along the lake would have occurred. More importantly, the flood on the Osage River would have been 17 feet higher in stage without Corps reservoirs to capture flood waters. A preliminary estimate of the damages prevented by our projects during this event, primarily Harry S. Truman, is $270 million.

This flood event did cause severe damage to private levees on both the Osage River and the lower Missouri River. We have approved repair of 13 levee projects and have received another 70 requests. We expect the federal cost of levee repairs to exceed about $3 million.

Our projects continue to prove a sound investment in the Missouri River basin. Through fiscal year 1986, projects in the Missouri River basin have prevented over $8.6 billion in flood damages.

## FISCAL YEAR 1988 PROGRAM REQUEST

The Missouri River Division program request for fiscal year 1988 is $102.5 million. This request is distributed: 2 percent for investigations, 17 percent for construction, and 81 percent for operation and maintenance.

The funds requested for general investigations will be applied to flood damage prevention studies. These funds will be used to start one new study, continue six cost-shared studies, and continue preconstruction engineering and design on two projects.

## GRAND RIVER BASIN, MISSOURI AND IOWA

The fiscal year 1988 program includes $310,000 for a reconnaissance study of the Grand River basin in Missouri and Iowa. The Grand River is a left bank tributary of the Missouri River, draining an area of 7,900 square miles in north-central Missouri and southern Iowa. An authorized plan of improvement consisting of five lakes and levee and channel improvements is no longer economically feasible. This study would reexamine the basin to identify projects in which there may be a federal interest.

## BLUE RIVER BASIN, KANSAS AND MISSOURI

The reconnaissance study on the Blue River basin is nearing completion with available funds. The basin lies within the urbanized area of metropolitan Kansas City. A construction project on the lower end of the Blue River is underway; however, serious flooding problems remain upstream. Potential solutions to these problems include channel modifications, levees, and nonstructural measures. The program request of $135,000 will provide the fiscal year 1988 federal share of the follow-on feasibility study, scheduled for completion in September 1989.

### TURKEY CREEK BASIN, KANSAS AND MISSOURI

The Turkey Creek basin is a 23-square-mile area within Kansas City, Kans., and suburbs in Johnson and Wyandotte Counties. The basin is nearly 100 percent urbanized with a significant amount of development existing in the flood plain. Large floods caused overbank flows to inundate highly developed areas in the central industrial district in Kansas City, Mo., as well as in Kansas City, Kans. The most recent flood occurred in September 1979. Both the cities of Kansas City, Kans., and Kansas City, Mo., support the study. The program request for fiscal year 1988 of $200,000 will be used to initiate feasibility studies.

### OSAGE RIVER BASIN, MISSOURI, ABOVE HARRY S. TRUMAN DAM

The study area of the Osage River basin, Missouri above Harry S. Truman Dam comprises about 40 percent of the 15,300 square mile Osage River basin. The state of Missouri is the nonfederal sponsor and is providing one-half of the study costs incurred subsequent to March 15, 1986. In order to accommodate the sponsor's funding capability, the completion of the study has been rescheduled to September 1991, and the program for fiscal year 1988 is $80,000.

### ST. JOSEPH, MO., AND VICINITY

The study of St. Joseph, Mo., and vicinity addresses the substantial flood hazard for several small tributary streams which flow through or near the city. Portions of the city are protected from Missouri River flooding by federally constructed levees. The most recent flooding occurred on June 7, 1984, and resulted in one death and severe monetary losses. The reconnaissance study is scheduled to be completed in December 1987. The program request of $150,000 for fiscal year 1988 will be used for the federal share of the feasibility study to be initiated in fiscal year 1988.

### PLATTE RIVER BASIN, COLORADO, NEBRASKA, AND WYOMING

The basinwide reconnaissance study of the Platte River basin in Colorado, Nebraska, and Wyoming is scheduled to be completed in May 1987. The preliminary results of the reconnaissance study have identified flood problems which may warrant additional reconnaissance and more detailed feasibility studies. The Urban Drainage and Flood Control District is the sponsor in the Denver metropolitan area. The program request of $80,000 for fiscal year 1988 will be used for the initial federal share of the feasibility study on Ralston and Leyden Creeks in the Denver metropolitan area. This study is scheduled for completion in April 1990.

### WATERTOWN, S. DAK., AND VICINITY

The Watertown, S. Dak., and vicinity study area consists of that part of South Dakota in the Big Sioux River basin above the Brookings-Moody County line. The Big Sioux River and the natural lakes in the valley are generally interconnected with surficial aquifers which are experiencing prolonged high water conditions. Lakeside developments in the towns of Watertown, Castlewood, Estelline, Bruce, and Brookings have experienced damages due to peak flood discharges. The reconnaissance study was funded under the eastern Dakota and upper Big Sioux River study. I anticipate starting the cost-shared feasibility study in fiscal year 1987. The program request for fiscal year 1988 of $175,000 will be used to continue the feasibility study.

### PERRY CREEK, IOWA

Funds in the amount of $174,000 are requested for preconstruction engineering and design for the Perry Creek project in Sioux City, Iowa. The project, authorized by the Water Resources Development Act of 1986, consists of channel improvements and reconstruction of about 4,000 feet of existing conduit. In fiscal year 1987, the general design memorandum will be completed and design model studies initiated. Fiscal year 1988 funds will be used for completion of the design model studies and to design the conduit.

### BRUSH CREEK, KANSAS CITY, MO.

Preconstruction engineering and design funds of $350,000 are also requested for the Brush Creek project in Kansas City, Mo., which was authorized by the Water Resources Development Act of 1986. The plan of improvement consists of deepening the channel an average of 5 feet from downstream of Roanoke Road for approximately 7,500 feet to just below Troost Avenue. Kansas City, Mo., the local sponsor, has proposed extending the project both upstream and downstream at local cost to further reduce flood damages in the Brush Creek basin. Funds requested for fiscal year 1988 will be used to complete the general design memorandum and start the preparation of plans and specifications.

## CONSTRUCTION, GENERAL

The request of $17.7 million for "Construction, general," will be used to start construction on one project and continue construction on seven projects.

### WESTERLY CREEK, COLO.

Funds are requested in fiscal year 1988 to start construction of the Westerly Creek project in Colorado. The Westerly Creek basin is located in the metropolitan Denver area. The proposed project consists of modification of Kelly Road Dam, construction of Upper Lowry Dam, and construction of two drainage channels into Upper Lowry Dam. The project is located within Lowry Air Force Base. The local sponsor will be the Urban Drainage and Flood Control District No. 69. The program request of $700,000 will be used to start relocations required for the Upper Lowry Dam on Lowry Air Force Base.

### CHATFIELD LAKE, COLO.

Chatfield Lake project, near Denver, is complete except for downstream channel improvements. Program requirements of $300,000 for fiscal year 1988 will be used to complete downstream channel construction and continue construction of recreational facilities along the downstream channel.

### MISSOURI RIVER LEVEE SYSTEM, IOWA, NEBRASKA, KANSAS, AND MISSOURI

The program request for the Missouri River levee system of $1.5 million will be used on several activities. On the recently completed Unit L–246, extensive slides have occurred on the lower Chariton River tieback and main stem levee. Funds requested for fiscal year 1988 will be used to complete the design and start the rehabilitation of these levees. Also, in fiscal year 1988 we will start the restudy of completed units and continue planning on two active units and continue the review of deferred and inactive units.

### BLUE RIVER CHANNEL, KANSAS CITY, MO.

Scheduled construction of stages 1 and 2 for the Blue River Channel project in Kansas City, Mo., is now 21-percent complete. Current year funds are being used to continue railroad relocations and to complete existing channel contracts.

Last year I reported that the cost estimate for this project increased about $5 million for design changes to the remaining work in this phase, resulting from unstable bank conditions detected during construction. Additional analysis indicates that the preliminary estimate of work is inadequate to control the highly unstable material. Additional construction will be necessary to avoid major slides in the tightly congested industrial areas. Work consists of constructing multiple rows of H-piling spaced a few feet apart to pin the unstable riverbanks prior to enlarging the Blue River Channel. This increased the cost estimate for the remaining work in stages 1 and 2 an additional $17.5 million. The time required to complete the redesign and the need to phase the follow-on construction will result in an additional 2 years to complete stages 1 and 2.

The $3.8 million requested for fiscal year 1988 will be used to complete railroad relocations required for stages 1 and 2, as well as to continue construction of the stage 2 channel.

### LITTLE BLUE RIVER LAKES, MISSOURI

The Little Blue River Lakes project consists of Longview and Blue Springs Dams. Longview Dam is complete. Diversion of flows through the outlet works of Blue Springs Dam was accomplished last August. Shortly after, a severe flood occurred in the basin which nearly overtopped the cofferdam which protected the dam closure section. In an around-the-clock operation, office and field forces of our Kansas City District protected the cofferdam slopes with filter cloth. Above normal rainfall and the flood operations prevented raising the embankment to the required height prior to winter. As a result, completion of the embankment and the entire project will be delayed 1 year. The request of $2.6 million for fiscal year 1988 will be used to continue construction of the Blue Springs Dam and service roads, as well as recreational facilities at both lakes.

### MISSOURI NATIONAL RECREATIONAL RIVER, NEBRASKA AND SOUTH DAKOTA

The Missouri National Recreational River project was authorized by section 707 of the National Parks and Recreation Act of 1978. This project was funded for new start construction in the fiscal year 1985 Supplemental Appropriation Act.

That act also required cost sharing under terms and conditions acceptable to the Secretary of the Army. These terms are essentially the same as provided by the Water Resources Development Act of 1986. A small recreation cost-sharing contract for construction of a boat ramp was negotiated in 1986. The request for fiscal year 1988 will be used to identify additional separable elements which could be justified under current cost-sharing criteria.

### PAPILLION CREEK AND TRIBUTARIES LAKES, NEBRASKA

The scheduled Papillion Creek and tributaries lakes project in Nebraska consists of the construction of four dams—sites 11, 16, 18, and 20—and the restudy of remaining flood problems in the basin. Sites 11 and 16 and the restudy are complete.

At site 20, the dam and relocations are complete. Cost-shared recreation facilities will be completed in fiscal year 1988.

The dam and relocations are also complete at site 18, and the dam is capable of performing its flood control function. Public Law 99-591 directed the Corps to resolve a potential water pollution problem by diverting treated effluent from two sewage treatment plants into one or two holding basins. This new effort will be cost shared with local interests who will be responsible for its design, construction and operation. The fiscal year 88 program will be used to complete work on the effluent storage work and initiate recreation facilities.

Public Law 99-591 and the Water Resources Development Act of 1986 authorized the construction of channel and railroad bridge improvements on the Big Papillion Creek between West Center Road and

L Street in Omaha, with a recreation trail located within the right-of-way and a basinwide flood warning system. Funds requested for fiscal year 1988 will be used to initiate preconstruction engineering and design.

These activities will require a total of $2.5 million in fiscal year 1988.

## Harry S. Truman Dam and Reservoir, Mo.

The Harry S. Truman Lake project in Missouri is regulated to achieve the purposes of flood control, hydropower, recreation, and fish and wildlife.

The $6.2 million requested for fiscal year 1988 will be used principally to continue procurement of intake gates and hoists for the powerplant. The remaining funds will be used for relocation of roads and municipal facilities, outlet channel erosion protection, and the construction of a satellite maintenance building.

### OPERATION AND MAINTENANCE

Our operation and maintenance program for fiscal year 1988 is $81.3 million.

Of the requested amount, $9.7 million, or 12 percent, will be used to maintain the 732 mile-long Missouri River navigation and bank stabilization project; $23.9 million, or 29 percent, will provide for operation and maintenance of our flood control facilities; $45.8 million, or 55 percent, will be used for operation and maintenance of our eight multipurpose power projects; and $3.7 million, or 4 percent, will be used for regulatory activities.

Mr. Chairman, this completes my brief report and I will provide my full statement for the record. I will be pleased to address any questions.

## Harry S. Truman Dam and Reservoir, Mo.

Senator Johnston. Thank you very much, General.

I understand you had a problem with fish going through the turbines at Harry S. Truman. Could you explain the problem and what you can do about it?

General Dominy. The Harry S. Truman powerplant was designed to have a pumpback capability. This means that after water is released through the turbines in the normal manner, water could be pumped back from the lake of the Ozarks into the Truman Lake during nonpeak times. During the testing of the pumpback operations, fish were drawn into the units and killed.

We have ceased pumpback operations and do not intend to use the powerplant in the pumpback mode for the foreseeable future.

Senator Johnston. But, what is causing the problem?

General Dominy. The problem is the high density of fish in the Lake of the Ozarks and the fact that they are drawn into the turbine during pumpback operations and are killed.

Senator Johnston. You can't screen?

General DOMINY. We tested it extensively with screens and nets. Test results led us to the conclusion that the current state of the art of fish protection does not provide a feasible structural solution.

Senator JOHNSTON. Well, that must be a tremendous place to fish. [Laughter.]

General DOMINY. It is good fishing; yes, sir.

### POTENTIAL NEW STARTS

Senator JOHNSTON. How many new projects, ones of the high probability of local cost-sharing support do you see coming along in your Division in the next, say, 4 or 5 years?

General DOMINY. Mr. Chairman, in the new Water Resources Development Act, there are some specific flood control projects that I think have a high probability of success.

There are five in our region, four of which I think have some genuine merit. I mentioned them in my testimony today—Perry Creek in Iowa, Westerly Creek in Colorado, Big Papillion Creek channel in Nebraska, and Brush Creek in Kansas City, Mo. They are the principal projects that I see in the near future.

Senator JOHNSTON. What would be the total estimated cost of those?

General DOMINY. The estimated cost of those four?

Senator JOHNSTON. Yes.

General DOMINY. The estimated cost of Perry Creek is about $48.2 million, of which $28.4 million is federal; Westerly Creek is about $11.8 million, of which $8.8 million is federal; Big Papillion Creek channel is about $6.5 million, of which $3.3 million is federal; and Brush Creek is about $16.8 million, of which $12.6 million is federal.

Senator JOHNSTON. Thank you, General.

Senator DeConcini?

Senator DECONCINI. I have no questions for General Dominy, Mr. Chairman. Thank you.

### ADDITIONAL QUESTIONS FOR THE RECORD

Senator JOHNSTON. Thank you very much, General Dominy. It is a pleasure to have you here. We will have some questions prepared by staff which will be submitted in writing.

General DOMINY. Yes, sir.

[NOTE: The following questions were not asked at the hearing, but were included in the hearing record for response by the Corps:]

## QUESTIONS SUBMITTED BY SENATOR JOHNSTON

### MISSOURI RIVER DIVISION

Senator JOHNSTON. What is the total Civil Works program for the Missouri River Division; and how much is for investigations, construction, and O&M activities?

General DOMINY. The Missouri River Division's Fiscal Year 1988 program request is $102.5 million. This includes $1,654,000 for General Investigations to start one new study, continue six cost-shared studies, and continue preconstruction engineering and design on two projects; $17.7 million for Construction, General to start construction on one project and continue construction on seven projects; and $83.1 million for Operation and Maintenance to maintain the 732-mile Missouri River navigation and bank stabilization project, to operate and maintain 24 flood control projects and eight multiple-purpose projects, and to administer and enforce the regulatory function.

Senator JOHNSTON. How many new projects - ones with a high probability of local cost-sharing support - do you see being put forth in the next 4-5 years?

General DOMINY. The Missouri River Division has one new construction start, Westerly Creek, Colorado, in the Fiscal Year 1988 program request. We estimate that four other projects will be available for new construction start within the next five years: Brush Creek, Kansas City, Missouri; Missouri River Levee System, Unit L385; Big Papillion Creek Channel Improvement, Nebraska; and Perry Creek, Iowa.

Senator JOHNSTON. Do you expect major changes in your budgetary requirements over the next 4-5 years?

General DOMINY. Our budgetary requirements should show a moderate increase over the next several years assuming new construction projects are initiated as they become available for construction.

Senator JOHNSTON. Briefly, how many and what types of projects were included in P.L. 99-662 for your area of responsibility?

General DOMINY. Projects in the Missouri River Division authorized by P.L. 99-662 include four flood control projects, four water resources conservation and development projects, three locations for streambank erosion control programs, three project modifications, and four miscellaneous programs and projects.

Senator JOHNSTON. How likely is it that non-Federal interests will want or be able to participate in the Federal water resource development under the new criteria?

General DOMINY. We are optimistic that non-Federal interests will participate in water resources development under the new criteria as set forth in P.L. 99-662. The enactment of the law has put an end to the controversy and uncertainty that surrounded cost sharing over the last several years. The Missouri River Division currently has a cost-sharing contract for one feasibility study, and negotiations are underway on four other studies. Coordination with potential sponsors of future construction projects indicate acceptance of the new cost-sharing requirements and a willingness to participate.

## MISSOURI NATIONAL RECREATIONAL RIVER, NEBRASKA AND SOUTH DAKOTA

Senator JOHNSTON. Tell the Committee about the Missouri National Recreational River project, including the benefits to be derived from the project.

General DOMINY. This project, authorized by Section 707 of the National Parks and Recreation Act of 1978, is located along the 59-mile reach of the Missouri River between Gavins Point Dam and Ponca State Park in Nebraska. The total Federal cost of the project as authorized has a limitation of $21,000,000. The project would consist of the acquisition of scenic easements and the construction of bank stabilization structures and recreation facilities. The project would preserve outstanding and important values of the river and would provide additional opportunities for river access and recreational use. This reach of the river contains habitat that could be protected or enhanced for the benefit of the least tern, piping plover, and possibly the bald eagle, all of which are listed as threatened or endangered species by the Secretary of the Interior. The reach is also one of the few remaining reaches of the Missouri River that is essentially free of man-made structures, and it still offers an example of the dynamics of a free-flowing river in a relatively natural state. These types of benefits do not lend themselves to the traditional Corps benefit-cost analysis.

Senator JOHNSTON. Has a non-Federal sponsor been identified to cost share the project?

General DOMINY. One cost-sharing agreement with the State of South Dakota for the construction of an access boat ramp was signed on 26 June 1986. Studies are ongoing to determine possible additional separable elements which could be justified under current policy.

Senator JOHNSTON. What are the major provisions of the cooperative implementation agreement between the Department of the Army and the Department of the Interior?

General DOMINY. The Chief of Engineers signed the Army-Interior Cooperative Agreement on 1 February 1980. The Cooperative Agreement specifies responsibilities for each agency. The Corps of Engineers is responsible for the following tasks: acquisition of land and interests in land; construction of bank stabilization measures; construction of recreation facilities; establishing criteria for irrigation pumps and associated pipelines in the designated corridor; project planning, construction, and operation and maintenance; and day-to-day management of recreation and interpretive features when construction is complete. The Department of the Interior agreed to two tasks: administer the designated segment as a recreational river and establish a Recreational River Advisory Group. This agreement has been superseded by P.L. 99-88. This fact was communicated to the Department of the Interior by the Assistant Secretary of the Army (Civil Works) in a letter dated March 17, 1986. I am inserting a copy of that letter for the information of the Committee. It should be noted that the cost sharing in Enclosure 1 to the letter was subsequently modified by P.L. 99-662.

[The letter follows:]

**DEPARTMENT OF THE ARMY**
**OFFICE OF THE ASSISTANT SECRETARY**
WASHINGTON, DC 20310-0103

17 MAR 1986

Honorable William P. Horn
Assistant Secretary for Fish, Wildlife
and Parks
Department of Interior
18th & C Streets, N. W.
Washington, D. C. 20240

Dear Mr. Horn:

Construction funding for the Missouri National Recreation River (MNRR) has been conditionally provided in the 1985 Supplemental Appropriations Act, Public Law 99-88. The Act requires the Army to enter into binding agreements with local interests based on cost sharing acceptable to the Secretary of the Army.

We have established a cost sharing policy for projects contained in Public Law 99-88 that is consistent with the agreement reached by the Administration and the Senate leadership contained in Senate Bill 1567. For the MNRR project this cost sharing is reflected in Enclosure 1.

Adherence to the principle of local cost sharing for the MNRR will necessitate significant local involvement in determining what project elements will be implemented and will enhance the likelihood of the project's implementation under present Federal fiscal conditions. Our field staff will exercise initiative and innovation to accommodate the interests involved and will attempt to implement a project that will meet the public's needs. As a first step in implementing the project, we are proceeding to obtain signed local cooperation agreements on individual recreation development sites using the enclosed cost sharing requirements.

Such cost sharing was not envisioned in the 1980 memorandum of agreement between your predecessor and the Corps of Engineers. At this time, I see no reason to develop a new agreement given the terms under which the project would be budgeted. Of course, the coordination between our field staffs on this project will continue.

Sincerely,

SIGNED

Robert K. Dawson
Assistant Secretary of the Army
(Civil Works)

15 January 1986

## Summary Of Cost Sharing Formula

## Missouri National Recreational River

| | Federal % | Local % |
|---|---|---|
| Recreation | 50 | 50 |
| Operation & Maintenance of Rec. Fac. | 0 | 100 |
| Fish and Wildlife Enhancement | | |
| - National Benefit | 100 | 0 |
| - Local Benefit | | |
| - Mulitple States | 75 | 25 |
| - Single State | 66 2/3 | 33 1/3 |
| Prevention of Erosion | | |
| - Federal Lands | 100 | 0 |
| - Private Lands | 0 | 100 |
| - Lands for the Project | 1/ | 1/ |
| Operation & Maintenance Bank Stabilization | 1/ | 1/ |

1/ The Cost sharing % will be based on the purpose for the acquisition of interests in the lands. For example, prevention of erosion on lands bought for recreational purposes would be 50% non-Federal with local interests responsible for operation and maintenance.

## HARRY S. TRUMAN DAM AND RESERVOIR, MISSOURI

Senator JOHNSTON. Bring the Committee up to date on the continuing problems with hydropower production at the Harry S. Truman project in Missouri.

General DOMINY. The problems are in two categories, mechanical and operational. Mechanical problems are affecting three of the six power units. Two units have problems in the mechanism that controls the angle of the adjustable turbine blades. One such unit can be operated because of a temporary repair that holds the blade at a fixed angle. The other unit has been taken apart to examine the problem and identify needed repairs. The time for putting the latter unit back in service is undetermined. Water was detected in the oil of a third unit which has been under repair since mid-December. Other maintenance on this unit is being performed while it is out of service. April is the earliest this unit is expected to be back in service.

Operational problems relate exclusively to the hydropower schedule. Currently, no more than four units would be used at once to generate from the multipurpose pool even if more were in service. This temporary ceiling on simultaneous generation is in compliance with the Corps' commitment to move gradually toward full-power operation with time between each phase to check for downstream impacts. The ceiling was raised from three to four units in December 1983. The Kansas City District has published annual reports on downstream monitoring conducted in 1982 through 1985. The monitoring effort continues. The report on monitoring in 1986 will be published shortly and reaffirms conclusions first expressed in the 1985 report to the effect that no unacceptable adverse downstream effects can be associated with the four-unit power operation. The Corps finds that monitoring at the four-unit level is sufficient and that data gathering on routine five-unit operation during at least part of the year should begin.

Use of the pumping feature is another matter. The potential damage to the Lake of the Ozarks' fishery from use of the pumping feature as presently constructed is unacceptable. Technology to eliminate this potential for fish entrapment or to reduce it to an acceptable level is not available. We are keeping abreast of evolving fish protection methods; however, we have not identified any techniques which show promise for use at the Harry S. Truman project. For the foreseeable future, the pumping feature will not be used. In that context, the pumping feature ceases to be a problem, although power customers are adversely impacted by the loss of dependable hydropower capacity that the deferral of pumping produces.

Senator JOHNSTON. What is the total cost of the project, and how much has been spent to date?

General DOMINY. The total estimated cost of the project is $550,000,000. Through January 1987, $525,000,000 has been expended.

Senator JOHNSTON. What has been the investment in hydropower facilities, and what hydropower benefits are currently being realized?

General DOMINY. From a total estimated cost of $120,500,000 specifically for hydropower, $112,700,000 has been invested to date. This current investment includes a first cost of $99,300,000 and interest cost during construction of $13,400,000.

Power benefits realized since the beginning of power operation amount to about $79,000,000. This benefit is comprised of an energy and a capacity benefit.

The energy benefit is based on a value of 20.5 mills for each kilowatt hour of energy produced. The capacity benefit is based on a plant capacity of 29,600 kilowatts and an annual value of $238.50 for each kilowatt of capacity based on a coal fired alternative thermal source.

Senator JOHNSTON. Are the downstream impacts associated with hydropower production out of line with other hydropower projects nationwide?

General DOMINY. Few hydropower projects in the United States discharge into an area endowed with resources as rich as those of the Lake of the Ozarks downstream of the Harry S. Truman project. The Lake of the Ozarks is a major body of water in the state, has a highly productive sport fish population and is heavily developed for recreation along most of its shoreline. The Lake of the Ozarks clearly has the potential to be impacted more severely than the typical downstream area. Nevertheless, after five years of intensive monitoring of the downstream effects of the Harry S. Truman operation, including the past three years of routine power operation with up to four units, no unacceptable changes to the downstream area have been identified.

Senator JOHNSTON. In your professional judgment, can this project be operated as originally envisioned?

General DOMINY. The pumping feature originally envisioned cannot be used now or for the foreseeable future. Mechanically, the units have been proven for pumping, but the loss to the downstream fishery that would occur is unacceptable. By contrast, the use of all six units to make power from the power pool may be achievable. We have seen no unacceptable downstream impacts from the routine use of four units and expect nearly imperceptible differences using five units rather than four. Because we have no experience with the routine use of five units operating exclusively from the powerpool, we consider speculation on the use of all six units some what premature. This reservation about the use of six units is in harmony with our commitment to move gradually toward full-power operation with time between each phase to check for adverse downstream impacts.

## SOUTH PACIFIC DIVISION

## STATEMENT OF BRIG. GEN. PATRICK J. KELLY, DIVISION COMMANDER

ACCOMPANIED BY:

EDWARD J. O'NEILL, CHIEF, PROGRAM DEVELOPMENT OFFICE

LAWRENCE L. FELBER, ASSISTANT CHIEF, PROGRAM DEVELOPMENT OFFICE

### INTRODUCTION

Senator JOHNSTON. Finally, we are glad to welcome Brig. Gen. Patrick J. Kelly, Division Engineer from the South Pacific Division.

What did you do to deserve that good duty post? [Laughter.]

General KELLY. You are absolutely correct, Senator.

Mr. Chairman and members of the committee, it is a pleasure to be here to address the civil works activities of the South Pacific Division and to discuss the details of our fiscal year 1988 budget.

I have with me Mr. Ed O'Neill, Chief of my Program Development Office to my left, and to my right, the Assistant Chief of Program Development, Mr. Larry Felber. Directly behind me, I have Mr. Ace Wanket, our Chief of Engineering, Mr. Dave Fulton, Chief of Construction Operations, and Mr. Frank Dunn, Chief of Planning.

### REGIONAL CHARACTERISTICS

The South Pacific Division covers a diverse area which includes nearly one-fifth of this country's land mass, encompassing an impressive array of geographic features, from the Continental Divide with high, arid deserts in the east, to the jagged coastal shorelines of the west—from the rugged Sierra Mountain peaks to the rich, fertile valley farmlands and vineyards.

The area is in the midst of a sustained population explosion that continues to impact our region's flood control and related needs. Since the 1980 Census, our population has increased nearly 15 percent and is predicted to experience similar growth throughout this century. Commerce along the Pacific rim also has significantly increased, creating a critical need to modernize our navigation systems.

### FISCAL YEARS 1986-87 ACCOMPLISHMENTS

Since last year, the South Pacific Division has made significant progress toward meeting these needs. Let me recount just a few.

### FISHERMAN'S WHARF AREA, CALIFORNIA

Construction of a breakwater to protect the Fisherman's Wharf area on San Francisco's waterfront was completed within budget and ahead of schedule. Dedication ceremonies were held this past October.

### SANTA CRUZ HARBOR, CALIF.

We completed the Santa Cruz Harbor project by acquiring a new dredge for the harbor district to operate and maintain as a sand bypassing system. The harbor district has assumed responsibility for all future maintenance dredging.

### PORT HUENEME, CALIF.

At Port Hueneme, we executed our first cost-sharing agreement since enactment of the Water Resources Development Act of 1986, on January 13 of this year, and we expect to complete the harbor expansion within the year.

### LOS ANGELES COUNTY DRAINAGE AREA, CALIFORNIA

We will complete the rehabilitation work on the Los Angeles County drainage area project this year, and I am pleased to report that our completion cost of about $30 million is substantially under the $47 million we had estimated when your committee provided initial funds in fiscal year 1984.

### SAN FRANCISCO BAY TO STOCKTON, CALIF.

With funds provided for the current year, we will complete two major elements of the San Francisco Bay to Stockton project: The deepening of the Stockton ship channel and the Richmond long wharf manuevering area to 35 and 45 feet, respectively.

### 1986 FLOODS

At this time last year, we were in the midst of a major flood that occurred throughout northern California and Nevada, causing about $400 million in damages. Our $3 billion investment in existing flood control projects prevented an estimated $13 billion in additional damages, just during this one flood.

An example of our flood fighting included remedial action along the Sacramento River, to restore levee integrity, reducing the threat of flooding to the key metropolitan area of Sacramento.

Subsequent to the floods, we spent about $13 million for restoration of damaged flood control structures with our Public Law 99 emergency authority.

### FISCAL YEAR 1988 BUDGET

Shifting now to the fiscal year 1988 budget, we are requesting $213.2 million compared to $173.2 million provided for the current year.

For planning and design activities under our general investigations program, the budget contains $16.8 million, about the same as that provided in fiscal year 1987.

Our request includes funds to initiate and complete three new reconnaissance studies.

### BEAR RIVER, UTAH

The Bear River study will examine potential solutions for flood control, water supply and related purposes in Utah, Idaho, and Wyoming. Since 1983, flooding along the Bear River has caused $9 million in damages and has been a major contributor to the serious damages around the Great Salt Lake.

### IMPERIAL AND SAN DIEGO COUNTY STREAMS, CALIFORNIA

The study of the Imperial and the San Diego County streams flowing into the Salton sea, in the Imperial Valley of southern California will investigate potential solutions to serious flood problems. Flooding along many of the area's streams and rising lake levels in the Salton Sea have continued to cause serious damage to highly productive agricultural and urban areas.

### SACRAMENTO METROPOLITAN AREA, CALIF.

We will also initiate a study of the flood problems of the Sacramento metropolitan area. Recent flood events have caused considerable concern over the level of protection provided by the Sacramento River flood control project. This study will evaluate the need for additional protection to that major urban area.

The budget also includes funds to initiate four preconstruction engineering and design activities.

### NOGALES WASH, ARIZ.

Design studies for Nogales Wash, along the international border in Arizona, will be initiated upon completion of the feasibility study. The probable plan of improvement will include channel and nonstructural solutions for the reduction of the frequent flooding and erosion problems in Nogales.

### OLD CROSS-CUT CANAL

Another new start in Arizona is the old cross-cut canal in the city of Phoenix. Design studies will consider a collection system, gate modifications, and channel improvements.

### CALIENTE CREEK, CALIF.

We will also initiate design studies for Caliente Creek, located about 15 miles southeast of Bakersfield, Calif. Damages from flooding during March 1983 were estimated at over $20 million and included closure of major transportation routes. The probable plan of improvement includes a flood detention basin and two downstream channels.

### TRUCKEE MEADOWS, NEV.

Our fourth new start is Truckee Meadows in the rapidly growing Reno-Sparks metropolitan area in Nevada. Flooding has caused millions of dollars in damages over the past 40 years, including $20 million in 1986. The proposed plan of improvement includes a combination of levees, floodwalls, and bridge replacements on the mainstem of the Truckee River, as well as a detention basin and backwater levees along the tributaries.

### LOS ANGELES-LONG BEACH HARBORS, CALIF.

Turning to our on-going program, the budget includes funds for continuation of the study of the Los Angeles-Long Beach Harbors. This harbor complex already has the highest customs revenue of any harbor in the country and is reaching saturation of its capacity. Modifications to navigation channels will be required to handle projected increased traffic.

### LOS ANGELES COUNTY DRAINAGE AREA, CALIFORNIA

Our Los Angeles County drainage area study, commonly referred to as the LACDA study, is examining the adequacy of completed flood control channels and dams protecting densely developed portions of Los Angeles County. To date, the existing project has prevented damages of about $4 billion. However, our studies indicate that the existing project may not be capable of fully controlling a 50-year storm event. The $650,000 in the budget will permit us to pursue our analysis and identify potential solutions.

### CACHE CREEK, CALIF.

We will continue to examine the very complex issues at the Cache Creek project in northern California. We will continue to study increasing the outlet channel capacity from Clear Lake in fiscal year 1988, while completing design of the downstream settling basin portion of the project with available funds this year.

### SANTA ANA RIVER, CALIF.

With funds provided in the current fiscal year, and with the budget request for the fiscal year 1988, we expect to complete preconstruction design of the critically important Santa Ana River project, including the Seven Oaks Dam, by June 1989. The three counties in the basin are presently establishing an appropriate sponsoring entity. In addition, and this is probably a first for the Corps, we are anticipating voluntary contributions during the design period.

### RILLITO RIVER, ARIZ.

In Arizona, upon approval of the feasibility report and receipt of local cost sharing assurances, design will be initiated for channel improvements along 13 miles of the Rillito River, to provide flood protection to metropolitan Tucson. Preconstruction engineering and design is scheduled for completion in June 1989.

For our construction program, $136.7 million, is included in the budget compared to $95.5 million expected to be available this year. Budgeted funds will permit us to begin construction of 2 projects, continue 14, and complete 7.

### RICHMOND HARBOR, CALIF.

The plan of improvement for Richmond Harbor provides for deepening navigation channels from 35 to 41 feet, selective widening, and construction of a turning basin, for a total estimated cost of $26.9 million, including a nonfederal share of $9.4 million. We are presently working with the sponsor on a staged construction approach.

### OAKLAND INNER HARBOR, CALIF.

Similarly, at Oakland Inner Harbor, we will deepen the existing navigation channels from 35 to 42 feet, widen the entrance and some interior channels, and construct a turning basin. The total estimated project cost is $31.3 million, including a nonfederal share of $12 million.

### PHOENIX AND VICINITY, ARIZONA

Let's now turn to our major ongoing construction efforts in Arizona and California. Our largest single request of $38 million will permit continuing construction of the Phoenix, Ariz., and vicinity project and includes major activities on the Arizona canal diversion channel. The budgeted amount is adequate to retain our scheduled completion date of September 1991.

### SACRAMENTO RIVER DEEP-WATER SHIP CHANNEL, CALIF.

We expect to award the first construction contract for the 43-mile-long Sacramento River deep water ship channel project this spring. Our schedule, developed in close cooperation with the sponsor, provides for completion of this key navigation project by September 1994.

### FAIRFIELD, AND VICINITY STREAMS, CALIFORNIA

We awarded the initial construction contract on the Fairfield project in northern California in September 1986. The fiscal year 1988 budget is based on the assumption that we will shortly renegotiate our local cooperation agreement in compliance with the new Water Resources Development Act and maintain our scheduled construction progress.

### SAN LUIS REY RIVER, CALIF.

Construction is scheduled to start this year on the San Luis Rey River project, which consists of channel improvements along the lower 7.2 miles of the river to protect the city of Oceanside in southern California. The total estimated cost is $45.4 million, including the local share of $11.5 million.

### OPERATION AND MAINTENANCE

For our operation and maintenance activities, our budget includes $59.7 million, which is about the same as the $61 million provided for the current year.

Our dredging program maintains over 400 miles of navigation channels, including vital facilities for national defense, commerce and recreation. Over 140 million tons of commerce annually move through our ports. Due to increased dredging requirements in San Francisco Bay over the next few years, we are evaluating additional disposal sites within the bay and offshore, and developing management plans to assure maximum usage of existing sites.

### CRESCENT CITY HARBOR, CALIF.

An important accomplishment was the placement of 760 dolosse armor units weighing 42 tons each to protect the Crescent City Harbor breakwater from massive wave forces. A unique aspect of this work will be the subsequent monitoring program to measure the forces on these structural units.

### VOLUNTEER PROGRAM

The Bay Model Regional Visitor Center in Sausalito continues to be a success. An outstanding volunteer program has been set up with the assistance of a county volunteer agency.

Mr. Chairman, this concludes my presentation.

### NEW CONSTRUCTION START FUNDING REQUIREMENTS

Senator JOHNSTON. Thank you very much, General Kelly.

General, how many new starts in the South Pacific Division has Congress actually appropriated money for?

General KELLY. Sir, we had five in 1985 and 1986. In fiscal year 1987 we had four, and then we have two budgeted in 1988.

Senator JOHNSTON. What is the federal cost of those projects?

General KELLY. Sir, we don't know the exact cost, but it appears that it is about $300 million, but I will be glad to supply the exact amount for the record.

### ADDITIONAL QUESTIONS SUBMITTED FOR THE RECORD

Senator JOHNSTON. I have several other questions prepared by the staff which I will place in the record.

General KELLY. Yes, sir.

[NOTE: The following questions were not asked, but were included in the hearing record for response by the Department:]

## QUESTIONS SUBMITTED BY SENATOR JOHNSTON

### NEW STARTS

Senator JOHNSTON. I note that the construction request is $137 million which is an increase of $41 million over the current level. How much of this increase is related to the recent new starts?

General KELLY. Sir, about $36.1 million of the $41 million increase results from increased requirements for the recent new starts.

Senator JOHNSTON. What impact will these new starts have on future budgetary requirements? How do you see your construction request increasing over the next 5 years?

General KELLY. Sir, these new starts will tend to keep our construction program about level over the next few years. Our projected Fiscal Year 1989 requirements are about $6 million greater than Fiscal Year 1988, and our Fiscal Year 1990 requirements will drop by nearly $48 million if there are no changes to our current authorized construction program.

INFORMATION FOLLOWS

### FY 1985 THROUGH FY 1988
### CONSTRUCTION NEW STARTS *
Dollar Amounts in Thousands

| Project | FY 88 | FY 89 | FY 90 | FY 91 | FY 92 | BALANCE |
|---|---|---|---|---|---|---|
| Oakland Inner Harbor | $ 3,800 | $ 7,400 | $ 7,218 | $ --- | $ --- | $ --- |
| Richmond Harbor | 900 | 10,600 | 7,271 | --- | --- | --- |
| Oakland Outer Harbor | 6,500 | 7,718 | --- | --- | --- | --- |
| Sacramento River DWSC | 11,000 | 8,100 | 4,400 | 2,800 | 740 | 10,007 |
| Fairfield Vicinity Streams | 3,900 | 1,688 | --- | --- | --- | --- |
| Merced County Streams | 2,400 | 677 | --- | --- | --- | 51,300 |
| Pajaro River | 1,865 | --- | --- | --- | --- | --- |
| Redbank and Fancher Creeks | 1,900 | 7,100 | 16,100 | 16,700 | 5,589 | --- |
| San Luis Rey River | 8,500 | 16,250 | 6,165 | --- | --- | --- |
| Wildcat & San Pablo Creeks | 5,360 | 3,550 | 4,834 | --- | --- | --- |
| Little Dell Lake | 5,500 | 9,840 | 7,015 | --- | --- | --- |
| Total Projected Requirements | $51,625 | $72,913 | $53,003 | $19,500 | $6,329 | $61,307 |

*Excludes potential FY 1989 through FY 1992 new construction starts.

### CONTINUING CONSTRUCTION
Dollar Amounts in Thousands

| Project | FY 88 | FY 89 | FY 90 | FY 91 | FY 92 | BALANCE |
|---|---|---|---|---|---|---|
| San Francisco Bay to Stockton | 2,700 | 3,850 | 1,750 | 582 | --- | 71,762 |
| Phoenix, AZ & Vicinity | 38,000 | 41,700 | 30,000 | 29,804 | --- | --- |
| Santa Rosa Wash | 7,000 | --- | --- | --- | --- | --- |
| Corte Madera Creek | 1,700 | 731 | --- | --- | --- | --- |
| Dry Creek Lake & Channel | 8,200 | --- | --- | --- | --- | 33,780 |
| Lower San Joaquin River | 1,002 | --- | --- | --- | --- | --- |
| Sacramento Rvr Maj/Min Tribs | 98 | --- | --- | --- | --- | --- |
| Sacramento Rvr Bank Protection | 9,500 | 8,800 | 8,000 | 4,466 | --- | --- |
| Sacramento Rvr Flood Control | 2,800 | 2,085 | --- | --- | --- | --- |
| Sweetwater River | 4,913 | --- | --- | --- | --- | --- |
| Walnut Creek | 5,100 | 6,900 | 553 | --- | --- | --- |
| New Melones Lake | 4,100 | --- | --- | --- | --- | 27,413 |
| Surfside-Sunset & Newport Bch | --- | 6,000 | 1,727 | --- | --- | 11,851 |
| Total Projected Requirements | $85,113 | $ 70,066 | $42,030 | $34,852 | --- | $144,806 |
| Total Construction Requirements | $136,738 | $142,979 | $95,033 | $54,352 | $6,329 | $206,113 |

### FY 1989 THROUGH FY 1992
### POTENTIAL NEW CONSTRUCTION STARTS
Dollar Amounts in Thousands

| Project * | Total Esitmated Cost |
|---|---|
| Noyo River and Harbor [Breakwater], CA | $ 5,800 |
| Noyo River and Harbor [Channel Extension], CA | 1,700 |
| Holbrook, AZ | 11,900 |
| Nogales Wash, AZ | 9,000 |
| Old Cross-Cut Canal, AZ | 23,700 |
| Rillito River, AZ | 26,000 |
| Cache Creek, CA | 32,800 |
| Caliente Creek, CA | 57,200 |
| Coyote Creek, CA | 26,000 |
| Guadalupe River, CA | 33,700 |
| Santa Ana River Mainstem, CA | 1,100,000 |
| Truckee Meadows, NV | 78,400 |
| TOTAL | $1,406,200 |

* The potential new construction starts on this list include all projects currently scheduled for completion of Preconstruction Engineering and Design through September 1991. No construction schedule has yet been approved for these projects.

### NEW STARTS

Senator JOHNSTON. Provide a table which shows how much of the total project cost will come from the states and local non-Federal entities.

General KELLY. Yes, I will.

[ The information follows:]

## BUDGETARY IMPACT OF NEW STARTS
Dollar Amounts in Thousands

| Project | Total Estimated Cost | Federal Cost | Non-Federal Cost | Non-Federal Cost State | Non-Federal Cost Local Sponsor |
|---|---|---|---|---|---|
| FY 1985 New Starts | | | | | |
| Fairfield Vicinity Streams | $ 21,000 | $ 10,500 | $ 10,500 | $ 8,307 | $ 2,193 |
| Little Dell Lake | 49,200 | 28,300 | 20,900 | 0 | 20,900 |
| Merced County Streams | 92,200 | 62,000 | 30,200 | 20,841 | 9,359 |
| Sacramento River DWSC | 73,500 | 39,500 | 34,000 * | 0 | 34,000 |
| FY 1986 New Starts | | | | | |
| Wildcat & San Pablo Creeks | 33,200 | 19,200 | 14,000 | 8,380 | 5,620 |
| FY 1987 New Starts | | | | | |
| Oakland Outer Harbor | 28,100 | 14,900 | 13,200 * | 0 | 13,200 |
| Pajaro River | 5,890 | 2,945 | 2,945 | 2,785 | 160 |
| Redbank & Fancher Creeks | 65,600 | 49,200 | 16,400 | 8,928 | 7,472 |
| San Luis Rey River | 45,400 | 33,900 | 11,500 | 3,507 | 7,993 |
| FY 1988 New Starts | | | | | |
| Oakland Inner Harbor | 31,200 | 19,200 | 12,000 * | 0 | 12,000 |
| Richmond Harbor | 26,800 | 20,100 | 6,700 * | 0 | 6,700 |
| TOTAL | $472,090 | $299,745 | $172,345 | $52,748 | $119,597 |

*Excludes any Future Non-Federal Reimbursement of up to 10% of project construction costs in accordance with Section 101, Water Resources Development Act of 1986.

## SAN LUIS REY RIVER

Senator JOHNSTON. What is the status of local support for the San Luis Rey River project?

General KELLY. Sir, the local sponsor, the City of Oceanside, has expressed its willingness to financially participate in construction of the project in accordance with the provisions of the Water Resources Development Act of 1986. We are currently working with the City of Oceanside in the development of an appropriate Local Cooperation Agreement. We expect that this agreement will be executed in June 1987.

Senator JOHNSTON. Is there, or do you expect, litigation which would delay the use of $8.5 million requested for 1988?

General KELLY. Sir, there is no litigation at this time, nor do we anticipate any litigation which would delay the use of the $8.5 million in 1988. However, there is an endangered species, the Least Bells Vireo, which is affected by the project. We are currently conducting Section 7 consultations with the U. S. Fish and Wildlife Service to determine appropriate mitigation requirements.

## SACRAMENTO RIVER FLOOD CONTROL SYSTEM

Senator JOHNSTON. Update the Committee on the Corps' activities related to the comprehensive analysis of the Sacramento River Flood Control System?

General KELLY. Sir, using the $600,000 provided this year we are examining the 120 miles of project levees, channels, and weirs protecting the Sacramento Metropolitan Area. In January we initiated the assessment of the physical condition of these features and the potential need for corrections to insure the integrity of the existing levee system. The work includes geotechnical explorations, laboratory analysis, field surveys, and hydraulic evaluations to determine channel capacities. Additionally, a determination of the Federal interest in any measures required to maintain the existing level of protection will be made, as well as an initial appraisal of the benefits which would be gained from increasing the level of project protection.

Senator JOHNSTON. Generally, what condition is the system currently in?

General KELLY. Sir, we really don't know the full extent of the problems the levee system may have. We do have reason for concern. Portions of the levee system have failed, at less than design capacity, during major floods over the last several decades. During the 1986 floods the Yuba River levee failed at the town of Linda, considerably below design stage, and resultant flooding caused about $95 million in damages. Other portions of the levee system were severely stressed and only extraordinary flood fighting measures prevented failure. Our design studies for repairs of the levees at the sites of failures, and near failures, revealed that some portions of the system appear to have been constructed with materials and techniques that would not be in consonance with current standards. Portions of the existing system were constructed many years ago by private landowners, and when the Federal project was authorized in 1917, these levees were incorporated in the Federal project with only some minor upgrading to add height or flatten side slopes. Operations, maintenance and rehabilitation of the project is the responsibility of the State of California, the local sponsor. It is the lack of detailed knowledge about the original levees that occasions our concern. In the three significant floods that have occurred in this decade we have had to make repairs at 65 sites spread through out the 980 mile levee system.

Senator JOHNSTON. Are there any preliminary conclusions or recommendations?

General KELLY. Sir, we initiated our studies just last month and are not able to make any conclusions or recommendations at this time. We are gathering a substantial amount of data which will need to be reviewed and evaluated.

Senator JOHNSTON. What is the Corps' schedule for finalizing its report?

General KELLY. Sir, we expect to complete a report on that portion of the Sacramento River Flood Control System in the metropolitan area of Sacramento in June 1988.

## LITTLE DELL LAKE, UTAH

Senator JOHNSTON. How has the $2.9 million appropriated for the Little Dell Lake project in Utah been utilized?

General KELLY. Sir, $1.8 million of funds appropriated for Fiscal Year 1987 are being used to continue project engineering and design and to initiate the plans and specifications for the dam and appurtenances. Of the remaining $1.1 million, $987,000 was transferred from the project and $113,000 was assigned as savings and slippage.

Senator JOHNSTON. What was the reason for transferring $987,000 from the project?

General KELLY. Sir, the $987,000 was determined to be surplus due to a change in cost sharing for scheduled relocations in Fiscal Year 1987. Relocations were initially programmed to be cost shared, with the local sponsors contributing only a portion of the funds for construction. However, the Water Resources Development Act of 1986 requires the local sponsors to provide all relocations. Consequently, this reduced the Federal funding required for Fiscal Year 1987.

Senator JOHNSTON. What impact did this transfer have on the completion schedule?

General KELLY. Sir, the scheduled work is being accomplished at non-Federal cost and there is no impact on the project completion schedule.

Senator JOHNSTON. How will the budget request of $5.5 million be used and does it maintain the completion date anticipated last year?

General KELLY. Sir, the $5.5 million for Fiscal Year 1988 will be used to initiate construction of the dam, outlet works, and spillway, and to continue engineering and design of other project features. The current project completion date of September 1990 is the same as presented to the Congress last year.

## ARIZONA CANAL DIVERSION CHANNEL

Senator JOHNSTON. Senator DeConcini?

Senator DECONCINI. Mr. Chairman, thank you very much.

General Kelly, thank you. I want to compliment you and your staff for the very fine response that they continue to give our office. I expect that is true of our entire delegation. We appreciate that. We know you are pulled and tugged at from a lot of different directions, but we are very pleased that you are meeting our needs, or at least addressing them.

I want to ask you about the Arizona Canal Diversion Channel project. The Corps has done a really great job in handling and coordinating the change, or the possible change, of the city council's position on reach 4 because of concerns from some of the residents. I understand that you are undertaking a feasibility study on the potential of detention basins. When will that be completed?

General KELLY. Sir, we are doing two studies in that particular area. What you are referring to essentially is reach 4.

Senator DECONCINI. Reach 4; yes, sir.

General KELLY. We have two studies. In one study, Congress has asked us to do a study on the economics of reach 4. That is ongoing by our Los Angeles District. That report will probably be available for our review at Division headquarters next month. In fact, we owe Congress a report on that in May.

Concurrently, as we were going through the economic reevaluation of reach 4, we were also asked, as you had correctly stated, by Maricopa County, the city of Phoenix, and some of the opposition to take a look at detention basins. Our Los Angeles District is doing that. That report will probably come in the same period of time, probably next month.

Senator DECONCINI. Do you have any preliminary indications on the feasibility of detention basins?

General KELLY. The idea of detention basins was that they would be able to store water and, thereby, reduce the width of the channel through the reach 4 area. The detention basins do help in reducing that width, but whether they are that cost effective has yet to be determined. Preliminary indications are that they are not.

### NAVAJO INDIAN RESERVATION STUDY, ARIZONA

Senator DECONCINI. Going to another subject, General Kelly, for the Navajo Indian Reservation, in fiscal year 1987 Congress appropriated $600,000 to the Corps to initiate a general investigation of flooding on the reservation. What progress have you made to date?

General KELLY. Sir, the funds were just released in the December timeframe. We just initiated that study in January. As you know, that is a very extensive area. It covers about 26,000 square miles, roughly the size of the state of West Virginia. So we have a reconnaissance effort, as I said, that will start in January, and it will be completed in June 1988.

### NOGALES WASH, ARIZ.

Senator DECONCINI. You also referred to, in your presentation, the Nogales Wash flood control project. I understand $100,000 has been requested for 1988 to initiate preconstruction activities in that area. Your budget justification indicates that the total federal cost of preconstruction activities will be $565,000 and that the total project cost will be $9 million. What additional capability does the Corps have on this project for 1988, and what activities could be undertaken if additional funds were made available?

General KELLY. Sir, we have sufficient funds in the budget. We are in the feasibility stage. In fact, the feasibility report will be due in January 1988.

Senator DECONCINI. So you have no further need at this time?

General KELLY. That is correct, sir.

Senator DECONCINI. Thank you.

### CLIFTON, ARIZ.

Mr. Chairman, I will submit additional questions, but let me just ask one more on Clifton, Ariz. Included in H.R. 6 was a section authorizing construction of a flood control levee in Clifton. What activities has the Corps undertaken to get this project underway?

General KELLY. Sir, we have a very active program right now trying to come up with a solution in Clifton. We have completed the feasibility report. As a matter of fact, about 2 weeks ago, I signed the Division Engineer's notice, and it is now out in the public. That report will be reviewed by the Board of Engineers for Rivers and Harbors, probably sometime during the summer. So the feasibility study is just about over, and we are recommending a favorable report.

Senator DECONCINI. I see no funding was requested in 1988. Is that because you don't have the feasibility study completed yet?

General KELLY. Yes, sir; that is not a cost-shared study. Until it goes through the proper review process by the Board and Washington review, it will not have any preconstruction engineering and design funds budgeted for it.

Senator DECONCINI. When is that likely to come about?

General KELLY. Sir, the Board will meet sometime this summer, and then it will go through the Washington review, so it will probably be later on in the fall.

Senator DECONCINI. We are talking about 1989 before we might have a budget request then for the Clifton project?

General KELLY. That is correct.

### RILLITO RIVER, ARIZ.

Senator DECONCINI. One last question, Mr. Chairman.

I want to congratulate the Corps for requesting funds to move forward with activities on the Rillito River bank stabilization project in Tucson. The sum of $300,000 has been budgeted for 1988. What is your additional capability on this project in 1988 and what is the schedule for completion of the project?

General KELLY. In the case of Rillito, that will be appearing before the Board probably next month during our spring review. That feasibility report is complete.

Senator DECONCINI. The report is completed, and final approval won't be until next month, I assume?

General KELLY. Yes, essentially, first from the Board, and then, sir, it goes to our Civil Works Director.

Senator DECONCINI. Do you have any additional capability on this project?

General KELLY. No; we do not.

Senator DECONCINI. You have none.

### ADDITIONAL QUESTIONS SUBMITTED FOR THE RECORD

Mr. Chairman, I have some additional questions I will submit for the record.

Thank you, General, very much. Thank you, gentlemen.

[NOTE: The following questions were not asked, but were included in the record for response by the Department:]

## QUESTIONS SUBMITTED BY SENATOR DECONCINI

### ALAMO LAKE

Senator DECONCINI. We allocated $350,000 in FY 87 to undertake a reconnaissance survey to determine what improvements need to be made to the existing Alamo Lake project on the Bill Williams River. Can you tell me about the progress being made on this survey?

General KELLY. Sir, the Alamo Lake study has been delayed to incorporate information resulting from the ongoing operation and maintenance evaluation of the dam. The reconnaissance study will be initiated in October 1987 and we anticipate completion in September 1988.

Senator DECONCINI. As is the case with the Navajo feasibility study, only $100,000 has been requested to begin the feasibility study in FY 88. What is the total cost of the study and how long would it take to finish under the requested funding schedule?

General KELLY. Sir, the feasibility study of Alamo Lake is estimated to cost $1,050,000. It is anticipated that the feasibility study will require about two and one-half years to complete. We expect to initiate the feasibility study in October 1988, and complete it in March 1991.

Senator DECONCINI. What is the additional capability of the Corps on this study in FY 88?

General KELLY. Sir, we have no additional capability on this study in Fiscal Year 1988.

### NOGALES WASH FLOOD CONTROL PROJECT

Senator DECONCINI. What steps must be taken before the construction portion of the Nogales Wash project can begin?

General KELLY. Sir, prior to initiating construction of the project, we will have to complete the processing of the feasibility report. This includes review by the Board of Engineers for Rivers and Harbors and the Chief of Engineers and approval by the Secretary. We also have to complete the design and comply with the National Environmental Policy Act. Finally, the project must be authorized by the Congress for construction, and a construction cost-sharing agreement must be executed with the non-Federal project sponsor.

### OLD CROSS-CUT CANAL

Senator DECONCINI. $100,000 has been requested in FY 88 to initiate preconstruction activities on the Old

Cross-Cut Canal project in Phoenix. Your budget justification indicates that the total Federal cost of preconstruction activities is $630,000 and that the total cost of the project is $24 million. What additional capability does the Corps have on this project in FY 88 and what activities could be undertaken if additional funding was available?

General KELLY. Sir, we have had to delay the completion of the feasibility report to September 1988 due to the necessity to distribute existing resources to all on-going efforts, and as such, we will be unable to initiate preconstruction engineering and design in FY 88 and will not be able to use the funds included in the budget for that purpose.

Senator DECONCINI. What steps must be taken before the construction portion of the project can begin?

General KELLY. Sir, similar to the Nogales project, we must complete the processing of the feasibility report and complete the design and environmental compliance process. Also, the project must be authorized for construction by the Congress and a construction cost-sharing agreement executed with the non-Federal project sponsor.

### HOLBROOK LEVEE PROJECT

Senator DECONCINI. Could you bring the Committee up to date on the status of activities that are being undertaken in FY 87 on the Holbrook levee?

General KELLY. Sir, during our prior design studies for Holbrook we had developed a proposal to solve the flood threat by treating the problem as a correction of a deficiency in the original project. Subsequently, the Water Resources Development Act of 1986 was enacted, authorizing construction of the Holbrook project as proposed in our survey report. No funds are available for FY 87, however the President's Budget for FY 88 includes funds to complete the General Design Memorandum. Preconstruction Engineering and Design, including plans and specifications for the first construction contract, is scheduled for completion in April 1989.

Senator DECONCINI. I note that $400,000 has been requested for preconstruction activities in FY 88. If an additional $200,000 was made available in FY 88, I assume the preconstruction activities could be completed. What is your schedule for completion of actual construction of the levee?

General KELLY. Sir, the budget amount of $400,000 is the maximum amount that we can effectively use in

Fiscal Year 1988. Preconstruction Engineering and Design is scheduled for completion in Fiscal Year 1989, with the remaining $200,000 required for preparation of plans and specifications. Assuming that funds to initiate construction were included in the Fiscal Year 1990 Budget, construction could be completed by September 1991.

## NAVAJO INDIAN RESERVATION

Senator DECONCINI. I see that only $100,000 has been requested to continue the Navajo Indian Reservation feasibility study in FY 88. With a total Federal cost of $900,000 for the feasibility study, at this rate, it would take nine years to complete the study. What is the Corps' capability on this project in FY 88 and what activities could be undertaken if additional funds were made available.

General KELLY. Sir, we have no additional capability on the Navajo study.

## SUBCOMMITTEE RECESS

Senator JOHNSTON. General Kelly, thank you very much. We are glad to have you on board. I thank all of you from the Corps for being here. Thank you very much.

We will recess until Thursday.

[Whereupon, at 11:03 a.m. Tuesday, February 24, the subcommittee was recessed to reconvene at 2 p.m. Thursday, February 26.]

# ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 1988

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THURSDAY, FEBRUARY 26, 1987

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
*Washington, DC.*

The subcommittee met at 2:35 p.m. in room SD–138, Dirksen Senate Office Building, Hon. J. Bennett Johnston (chairman) presiding.

Present: Senators Johnston, Burdick, Hatfield, and Domenici.

## DEPARTMENT OF THE ARMY—CIVIL

### CORPS OF ENGINEERS—CIVIL

### NORTH PACIFIC DIVISION

### STATEMENT OF MAJ. GEN. GEORGE R. ROBERTSON, DIVISION ENGINEER

**ACCOMPANIED BY:**

- **DELBERT E. OLSON, CHIEF, PLANNING DIVISION**
- **HERBERT H. KENNON, CHIEF, ENGINEERING DIVISION**
- **TERENCE M. McKIERNAN, CHIEF, CONSTRUCTION-OPERATIONS DIVISION**
- **ALLEN W. SUMMERS, CHIEF, PROGRAMS MANAGEMENT OFFICE**
- **J. MICHAEL SMITH, ASSISTANT CHIEF, PROGRAMS MANAGEMENT OFFICE**

### INTRODUCTION OF WITNESSES

Senator JOHNSTON. The subcommittee will come to order.

Welcome from the committee to all of our friends from the Corps. Some of you are new, and we are very pleased to have you here today.

This afternoon we continue our hearings on the fiscal year 1988 budget requests. We will receive testimony from three principal witnesses from the Corps of Engineers. We extend a warm welcome to each of you and welcome our first witness, Maj. Gen. George R. Robertson, Division Engineer of the North Pacific Division. Following General Robertson will be Maj. Gen. Jerome B. Hilmes, Division Engineer of the Southwestern Division, and finally, Brig. Gen. Joseph Pratt, Division Commander of the North Central Division.

We are glad to have each of you with us today. You may want to introduce those you have with you and then proceed with your presentations. Your entire statements, of course, will be placed in the record.

General Robertson, please proceed.

## OPENING REMARKS

General ROBERTSON. Thank you, Mr. Chairman.

Mr. Chairman, I have the honor to appear before you today to report on the civil works activities of the Corps of Engineers in the North Pacific Division and to present our program requirements for fiscal year 1988.

Staff members with me today are Mr. Herb Kennon, Chief of Engineering; Mr. Deb Olson, Chief of Planning; Mr. Terry McKiernan, Chief of Construction-Operations; Mr. Al Summers, Chief of Programs Management; and his assistant, Mr. Mike Smith.

Sir, I would like to submit for the record my prepared status report and to present a brief oral summary.

Senator JOHNSTON. Without objection, the full prepared statement will be included following your oral remarks.

General ROBERTSON. The North Pacific Division includes Alaska and the Pacific Northwest. These two areas comprise more than 880,000 square miles, or about one-fourth of the land mass of the United States.

The Corps of Engineers' water resources projects in the Pacific Northwest and Alaska have served the region and the nation well. We foresee many opportunities in the future to continue this legacy of service to the people and the economy of the region.

## HYDROELECTRIC POWER GENERATION

The Columbia River basin is the source of more than 68 percent of the Pacific Northwest's electrical energy. Last year, the Columbia River hydropower system generated 125 billion kilowatt-hours of pollution-free energy. Sixty billion kilowatt-hours of this came from the Corps' 21 hydroelectric projects. This is enough to meet the needs of 8.5 million homes and is equivalent to almost 100 million barrels of oil.

The value of the power to date from these projects is more than five times their total original costs, and that is not even considering the value of other project benefits.

## FLOOD DAMAGES PREVENTED

Flooding in the Columbia River basin is essentially controlled today as a result of levees and a major system of storage reservoirs designed and operated by the Corps.

Flood damages prevented by Corps' projects in the Pacific Northwest and Alaska now total more that $9 billion. That is more than three times their total original costs. About $42 million in flood damages were prevented during November 1986 when the winter rainstorms occurred in western Washington. An additional $1 million in damages were prevented through Public Law 84–99 activities at a federal cost of $95,000.

The section 105 navigation projects in our region include 27 small boat harbors in Alaska. These projects provide more than 1,000 miles of navigable waterways to transport our nation's commerce and to provide for commercial fishing and recreational activities.

To offset the impacts of our dams on migrating salmon and steelhead, we have provided fish hatcheries, fish passage facilities, special flows and spills, and fish transportation systems. These efforts, along with accomplishments by others and favorable ocean conditions, are beginning to produce positive results. In 1986, fall chinook and steelhead adult returns past Bonneville Dam on the Columbia were especially encouraging. Other salmon runs show moderate increases.

Enactment of the Water Resources Development Act of 1986 was greeted with enthusiasm by many development and environmental interests in the Pacific Northwest and Alaska. Port officials in particular have expressed a desire to move ahead, and we are working with them now on cost-sharing arrangements.

We in the North Pacific Division are likewise encouraged that the Congress and the administration have given us the authority to proceed with the planning, design and construction of much-needed water resources projects.

## PROGRAM SUMMARY

Our program for fiscal year 1988 is $327,531,000. Construction accounts for about 48 cents of each dollar; operations and maintenance of existing projects takes about 50 cents; and general investigations is allocated about 2 cents. Our construction program includes $20 million to be derived from the inland waterways trust fund.

The fiscal year 1988 program I am presenting will include 15 general investigations studies. Twelve of these are continuing, including several interims, and six will be completed. Also, three studies will be funded as new starts. The program will allow construction to proceed on 11 projects. Under operations and maintenance, we will continue to operate and maintain 34 multiple-purpose hydropower and flood control projects and 31 navigation projects.

## GENERAL INVESTIGATION STUDIES

I will outline our program based on the primary funding categories contained in our request. Let me start by highlighting some of our major general investigations studies.

An interim feasibility report and environmental impact statement will be completed in January 1988 for the Galloway multiple-purpose storage site in Idaho under the upper Snake River and tributaries study. Galloway Dam has strong local and state support and is included in the program of the Northwest Power Planning Council.

A reconnaissance study of the Mud Lake closed basin in Idaho would be initiated and completed with fiscal year 1988 funds. The lake is formed by a 10-mile-long irrigation dike that is subject to overtopping and failure. Damages of more than $4.5 million could result if the dike were to fail.

Detailed studies in the Umpqua River basin, Oregon, are continuing on alternative multiple-purpose reservoir plans identified during preliminary studies. The local sponsor has stated its willingness to participate in detailed study and construction cost sharing.

Record flooding at Malheur Lake in Oregon has resulted in $21.6 million in damages through 1986. Feasibility studies for a solution to this flooding are continuing and we expect to complete the final report this spring.

Vessels calling at Coos Bay, Oreg., must incur costly delays waiting for favorable entrance and tide conditions. In fiscal year 1987, we began the reconnaissance phase of the study, and fiscal year 1988 funds would initiate the feasibility phase.

Similarly, fiscal year 1988 funds will be used to initiate feasibility-phase studies at Olympia and Bellingham Harbors in Washington, with the nonfederal sponsor sharing 50 percent of the cost.

## PRECONSTRUCTION ENGINEERING AND DESIGN

We have two new starts under preconstruction engineering and design at Centralia, Wash., which experiences $3.5 million in flood damages annually, and at Homer, Alaska, where the state has spent more than $6 million to prevent Homer Spit from being severed.

Design and environmental studies for channel and bridge clearance improvements at Grays Harbor, Wash., will be completed, including preparation of a general design memorandum and EIS supplement. Also, plans and specifications for channel dredging will be prepared in fiscal year 1988.

Funds provided in fiscal year 1987 for the Blair-Sitcum Waterway at Tacoma, Wash., will be used to perform bridge replacement design. However, planning and engineering studies for channel improvements have been deferred, awaiting the resolution of dredge disposal site locations and Indian land claims.

The St. Paul Island Harbor project in Alaska is unique in that local interests have already begun construction of the authorized federal project. We are negotiating with them for possible reimbursement of any additional work, under the provisions of section 204(e) of Public Law 99-662. Fiscal year 1988 funds would be used to continue preconstruction engineering and design studies which were begun in fiscal year 1987.

## CONSTRUCTION

Our major construction projects are Elk Creek Lake in Oregon, the Mount Saint Helens sediment retention structure in Washington, the new Bonneville Dam navigation lock, and the Snettisham hydroelectric project in Alaska.

At Elk Creek, county road relocation has been completed and construction of the dam is continuing. Completion of this modern roller-compacted concrete structure is scheduled for fiscal year 1989.

The main contract for construction of the sediment retention struction at Mount Saint Helens was awarded in December 1986, with completion scheduled for fiscal year 1990. Dredging of material from the Toutle River is now being accomplished. Levee improvements and dredging in the Cowlitz River are planned for fiscal year 1988.

At Bonneville Dam, design of the new navigation lock is continuing, with the major contract for lock construction set for award in fiscal year 1988. Completion is scheduled in 1992. Contracts for railroad relocation and site preparation are underway and excavation for the lock is planned to begin this year.

At the Snettisham project in Alaska, construction of a tunnel from Crater Lake to the underground powerhouse and installation of a third power unit continues. Power on line continues to be scheduled for February 1989.

Work to upgrade the original 16 generating units at Chief Joseph Dam on the Columbia will be completed in early fiscal year 1988, bring the project's capacity to almost 2.3 million kilowatts. Fiscal year 1988 funds would be used to initiate major changes to the turbine units to correct the low efficiency problem of the additional 11 units at the project. Gaining the contract-required efficiency would result in $6.5 million worth of additional power each year.

The eighth hatchery of nine planned for the lower Snake River fish and wildlife compensation plan is scheduled to be operational this year. The final hatchery design will be completed once the water supply is determined.

Our major flood control project in Alaska, Chena River Lakes, is nearing completion. Local interests will assume operation and maintenance responsibilities for the levee and interior drainage system this year.

At Bethel, Galena, and Dillingham, Alaska, we are working with the local communities to resolve serious bank erosion problems. Rock revetment protection was placed at Bethel last summer and is scheduled for Galena this year.

Work to rehabilitate the 39-year-old Mud Mountain Dam in Washington will begin this year with construction of a cutoff wall through the center of the dam. Construction to raise the dam and spillway walls to control major floods will begin in fiscal year 1988.

## OPERATIONS AND MAINTENANCE

Under operations and maintenance, we continue to update our aging powerhouse generating equipment to reduce breakdowns and lengthy repairs. Repair and modernization work at McNary Dam on the Columbia is being completed with fiscal year 1987 funds, while similar work at Bonneville Dam would be continued with fiscal year 1988 funds. Major rehabilitation of the turbines and generators at John Day Dam on the Columbia also would be continued with fiscal year 1988 funds.

We are continuing to improve the survival of migrant salmon and steelhead at our projects through the use of fish screens and other measures previously mentioned. Our focus is to determine the feasibility of installing or modifying juvenile fish bypass systems at our lower Columbia and Snake River projects to reduce fish mortality and costly spills.

Our study is continuing of the growing flood threat to Lewiston, Idaho, caused by sediment infill near the confluence of the Clearwater and Snake Rivers in the lower Granite Pool. We will dredge on an interim basis to restore adequate flood control and navigation depths.

About 23.7 million cubic yards of material were removed from coastal rivers and harbors in fiscal year 1986 by private industry plant and the Corps' hopper dredges *Essayons* and *Yaquina*. These two dredges, part of the Corps' minimum fleet, accounted for 9.2 million cubic yards of the total.

### MISCELLANEOUS

Under the miscellaneous category, we are helping the U.S. Navy prepare for establishment of a home port at Everett, Wash. We are completing our efforts on the Navy's permit application for dredging.

Our continuing authorities program remains active. In fiscal year 1986, construction was completed on the section 107 small navigation projects at Kalama, Wash., and Mekoryuk, Alaska, and three section 14 emergency bank protection projects and two section 208 clearing and snagging projects in Idaho, Oregon, and Washington. The section 205 study of ice jam flooding at Salmon, Idaho, will be completed upon receipt of the results of ongoing ice-barrier research.

### SUMMARY

In summary, Mr. Chairman, our fiscal year 1988 program of $327,531,000 provides for continued operation of our existing water resources system as well as for continued orderly development.

Mr. Chairman, this concludes my remarks and I will be happy to answer any questions you may have.

[The statement follows:]

## STATEMENT OF MAJ. GEN. GEORGE R. ROBERTSON

Mr. Chairman, distinguished members of the committee, I have the honor to appear before this committee to report on the civil works activities of the Corps of Engineers in the North Pacific Division and to present our program requirements for Fiscal Year 1988.

### AREA OF RESPONSIBILITY

The North Pacific Division comprises two widely separated geographical areas: the northwestern region of the United States, encompassing all or parts of seven states, more commonly referred to as the Pacific Northwest; and the State of Alaska. These two areas total 883,000 square miles, or about one-fourth the land area of the United States. The Division headquarters is located at Portland, Oregon, and the four district offices are at Portland, Oregon; Seattle, Washington; Walla Walla, Washington; and Anchorage, Alaska.

The Columbia River is a major physical feature of the Pacific Northwest. Flowing a distance of 1,200 miles from British Columbia, Canada, to the Pacific Ocean, it drops in elevation about 2,600 feet on its journey.

The Columbia Basin is the third largest drainage system in the continental United States. The Corps of Engineers' role in the Columbia Basin has been to develop its water resources for flood control, navigation, hydropower and other purposes. Protection of the environment and the rich natural resources of the region continues to be of primary concern.

### ACCOMPLISHMENTS AND OPPORTUNITIES

Corps of Engineers water resources projects in the Pacific Northwest and Alaska have served the region and the nation well through the years. Looking to the future, we foresee many opportunities to further support the daily lives of the people and the economy of the Pacific Northwest and Alaska.

### Hydropower Accomplishments

Hydroelectric power is vital to the Pacific Northwest's economic health. The Columbia River Basin is the source of more than 68 percent of the region's electrical requirements. Last fiscal year, the Columbia River Hydropower System generated 125 billion kilowatt-hours of pollution-free energy.

The Corps of Engineers' 21 hydroelectric projects in the Pacific Northwest generated 60 billion kilowatt-hours, or about 33 percent of the total electrical energy produced by all sources in the region. This would be enough to meet the needs of eight and one-half million homes. The 60 billion kilowatt-hours is equivalent to more than 99 million barrels of oil.

The output to date from these 21 hydroelectric projects has been of tremendous value to the economy of the region. The market value of the power generated is more than five times the total original cost of the projects.

At the Bonneville project, for example, power generated from both the original powerhouse and second powerhouse, added in 1983, totals more than 183 billion kilowatt-hours during the past 50 years. While this represents enough energy to light and heat more than 26 million homes for a year, this power has also fueled industrial growth, with a major share of the U.S. aluminum smelting drawn to the region by lower electrical rates. We plan to celebrate the Bonneville project's 50th anniversary in the late summer of this year.

### Flood Control Accomplishments

Flooding at major damage centers in the Columbia River Basin is essentially controlled as a result of levees and a major system of storage reservoirs designed and operated by the Corps. On the lower Columbia, in the vicinity of Portland, Oregon, and in the Willamette Valley, more than 400 miles of levees and 25 upstream flood control reservoirs have reduced what would have been disastrous floods to minor damage levels. For example, flood damages prevented to date in the Portland area and along the Willamette River total approximately $6.6 billion.

The reservoirs in the Columbia Basin are operated by the Corps' Reservoir Control Center in Portland, Oregon. Three of these projects are in Canada, operated through the Columbia River Treaty, while another six are Bureau of Reclamation projects.

Flood damages prevented by Corps of Engineers projects in the Pacific Northwest and Alaska now total in excess of $9 billion to date. This represents more than three times the investment costs of the projects. This includes approximately $42 million in flood damages prevented during the recent November 1986 winter rain storms in western Washington which resulted in near-record rainfalls in several smaller river basins. An additional $1 million in damages were prevented through PL 84-99 activities at a Federal cost of $95,000.

## Navigation Accomplishments

The North Pacific Division has 105 authorized navigation projects including 27 small boat harbors in Alaska. These projects provide more than 1,000 miles of navigable waterways to transport our nation's commerce and to provide for commercial fishing and recreational activities. Our FY 88 program includes funds for continued operations and maintenance of 36 navigation projects.

The dredges ESSAYONS and YAQUINA, two of the Corps' four hopper dredges in its Minimum Fleet, removed 9.2 million cubic yards of material from west coast rivers and harbors in FY 86.

Dredging was accomplished by the YAQUINA at four Oregon shallow-draft coastal harbors during the past fiscal year. Improvements at the Umpqua and Rogue river projects have reduced our maintenance dredging workload. In addition, breakwater extensions at Siuslaw River have improved the dredging picture in the interior channel reaches by scouring and flushing sediments to the sea. Temporary increases in sediment accumulations at the seaward ends of the jetties are expected to dissipate in the next few years. Potential for improvements in navigation are apparent and although initial dredging requirements remain high they should decrease and may become non-existent when the channel stabilizes.

## Anadromous Fisheries Accomplishments

The Corps has provided fish hatcheries, adult and juvenile fish passage facilities, water control structures, special flows and spills, and fish transportation systems to offset the impacts of its dams on the salmon and steelhead runs in the Columbia River Basin. Positive results are beginning to be reflected in the adult fish returning to the Columbia River system.

In 1986, two groups of fish, fall chinook and steelhead, returned as adults in very encouraging numbers past Bonneville Dam. Other salmon (spring and summer) runs also are increasing, but to a lesser degree. In addition to the cooperative efforts of the Corps and federal, state and private fisheries agencies, improved ocean conditions and restrictive fishing regulations also have contributed to increased adult survival.

Our estimated costs to incorporate measures in federal projects to reduce and compensate for impacts on salmon and steelhead through FY 1986 total $440 million. Our annual operation and maintenance costs for hatcheries, fish passage facilities, fish transportation and research is approximately $16 million.

## Future Opportunities Under-PL 99-662

Enactment of Public Law 99-662 (Water Resources Act of 1986) was greeted with enthusiasm by many development and environmental interests in the Pacific

Northwest and Alaska. Port officials in particular have expressed a desire to move ahead with needed projects authorized in the new legislation, and we are working with them on cost-sharing arrangements.

Likewise, we in the North Pacific Division are encouraged that the Congress and the Administration have given us the authority to proceed with the planning, design, and construction of projects for navigation, flood control and other beneficial purposes in the public interest. We welcome the opportunities and challenges.

## PROGRAM SUMMARY

Our program for FY 88 totals $327,531,000. Construction accounts for $156,800,000, or about 48 percent of each dollar; Operation and Maintenance of existing projects takes $163,707,000, or about 50 percent; and General Investigations for potential projects is allotted $7,024,000, or about two percent of each requested dollar. Our construction program includes $20,000,000 to be derived from the Inland Waterways Trust Fund.

The FY 88 program will include 15 General Investigations including several interims, of which six will be completed. Also, three studies will be funded as new starts. The program will allow construction to proceed on 11 projects. Under Operation and Maintenance, we will continue to operate and maintain 34 multiple purpose hydropower and flood control projects, as well as 31 navigation projects.

Our resource projects serve a variety of needs. I will outline our program based on the primary funding categories contained in our request.

## STUDIES

### Columbia River and Tributaries Study

Our request includes funds to continue the Columbia River and Tributaries Study. During FY 88, emphasis will be placed on updating the multiple-purpose system management plan for the Columbia River and its major tributaries. In addition, resource assessments and detailed studies will be made on measures necessary to insure multi-purpose considerations are reflected in the Northwest Power Planning Council's plans.

We will also continue the investigation of selected multi-purpose projects oriented toward meeting critical regional water resources needs, such as balancing competing river water uses, flood damage reduction, navigation, low flow augmentation and hydropower generation.

Detailed studies will be completed on providing shallow draft commercial navigation from Pasco, Washington, to the Wenatchee, Washington, area on the Columbia River. This would facilitate the shipment of agricultural commodities from central Washington down the Columbia River, and the delivery of petroleum and fertilizer upriver.

Detailed feasibility studies and a draft report and Environmental Impact Statement (EIS) on multiple-purpose development on the Similkameen River, in Washington, will also be completed. We will also continue with detailed feasibility on developing a multiple-purpose projects at the Fitzgerald Falls site on the St. Joe River in Washington. This site could provide needed local flood protection, supplemental water supply, flow augmentation for fish, and hydropower generation for the region.

Detailed feasibility studies of providing increased flood protection along the lower Columbia River will also be continued with FY 88 funds. Recent study of the physical condition of the existing levees along the lower Columbia cast doubt on their ability to provide protection from a 100-year flood event. Providing at least 100-year protection to this rapidly-developing reach of the river is essential to the area's economy.

## Upper Snake River and Tributaries

The Upper Snake River and Tributaries extend from the headwaters of the Snake River in Wyoming, down to and including the Weiser River in Idaho, a distance of about 400 miles. The watershed includes about 73,000 square miles, mostly in southern Idaho.

Current water resource problems and opportunities are associated with uses of surface and groundwater resources in the interest of flood damage reduction, water quality, hydropower, irrigation, public water supply, fish and wildlife, and recreation. Existing storage projects have significantly reduced flood damages; however, the threat of flooding still exists on most tributaries and selected mainstem reaches. Power demand in southern Idaho has grown due to new irrigation development requiring high-lift pumping, conversion of irrigation systems to sprinklers, and growth in the food and phosphate processing industries. Another major concern is the prospect of lower flows in the Snake River resulting from projected irrigation development. The Idaho Department of Water Resources has concluded storage for power generation and streamflow maintenance should be a priority consideration.

There are five interim studies underway which address the water resource needs of the Upper Snake River: Owyhee River Basin, Portneuf River Basin, Weiser River Basin, Snake River in Wyoming, and Big Lost River. An interim feasibility report and EIS will be completed on the Galloway multiple-purpose storage site on the Weiser River in January 1988. Galloway dam has strong local and state support, and is included in the program of the Northwest Power Planning Council.

FY 88 Funds will be used to complete detailed studies and prepare an interim feasibility report and EIS for the Snake River in Wyoming, continue detailed studies of alternative plans for the Portneuf River Basin, and initiate detailed studies of alternatives for both the Owyhee River Basin and Big Lost River interim studies.

## Mud Lake, Idaho

The Mud Lake area is a closed basin some 50 miles northwest of Idaho Falls, Idaho. The Lake was formed many years ago when local farmers constructed a 10-mile-long irrigation dike.

Since 1969, costs for flood fighting by the Corps of Engineers have been about $618,000, and state and local costs have been almost $300,000. If the dike were to fail, damages could exceed $4.5 million. Due to the serious impact of potential flood damages, the local interests have begun paying assessments to finance dike improvement. Jefferson County and the Idaho Department of Water Resources support the Corps study. FY 88 funds will be used to initiate and complete a reconnaissance study at Federal cost.

## Puget Sound and Adjacent Waters

The Puget Sound area in northwestern Washington has 10 major and 12 minor rivers flowing into the Puget Sound, Georgia Strait, Hood Canal, and the Strait of Juan de Fuca. Its 13,200 miles of land include the urban centers of Seattle, Tacoma, Everett, and Olympia. Puget Sound's 2,500 square miles of salt water form an inland sea with 10 major ports having deep-water access to the Pacific Ocean.

Several interim studies have been undertaken to address water resource problems and needs of the Puget Sound, which were identified in a comprehensive study completed in 1971. To date, six studies focusing on hydropower, deep draft navigation, flood damage reduction and recreational boating needs have been completed. Detailed studies are underway on shallow draft navigation needs for Neah Bay, and on providing flood protection on the Snoqualmie River for the City of Snoqualmie along the South Fork Skokomish River. FY 88 funds will be used to complete these detailed studies, including feasibility reports and EIS's for the Neah Bay and Snoqualmie studies. Feasibility studies on the Skokomish will be continued.

## Chehalis River and Tributaries

The Chehalis River Basin in Washington contains 2,114 square miles and drains into Grays Harbor in western Washington. The communities of Centralia, Chehalis, Aberdeen, and Hoquiam are subject to major flooding.

Three interim feasibility reports have been completed, including two which have been authorized by PL 99-662, for construction of flood damage reduction improvements for urban areas at South Aberdeen-Cosmopolis and Centralia-Chehalis. Planning and engineering studies underway for the South Aberdeen-Cosmopolis area will be completed with FY 87 funds. Preconstruction engineering and design studies will be initiated for the Centralia-Chehalis project with FY 88 funds. An interim report completed in 1982 recommended the addition of hydropower and fish enhancement facilities to Wynoochee Dam near Aberdeen. The City of Aberdeen has applied for and is expected to receive a FERC license to construct the hydropower addition themselves.

FY 87 funds are being used to complete detailed studies of the remaining flood problem areas at Aberdeen and Hoquiam, and to prepare a draft and final feasibility report and EIS.

## Umpqua River and Tributaries, Oregon

The 4,550-square mile Umpqua River Basin drains much of southwestern Oregon. Its major water resource needs are located in the South Umpqua River Basin. Average annual flood damages are estimated to exceed $2 million at 1986 price levels. Depleted streamflows in the summer have created a need for approximately 25,000 acre-feet of stored water for irrigation, municipal and industrial purposes before the year 2020. Warm and polluted summer flows have been identified by fishery agencies as the major factor inhibiting restoration of anadromous fish resources. An additional 30,000 acre-feet of water is needed to augment low summer flows for instream use.

FY 87 study funds are being used to continue detailed studies of alternative multiple-purpose reservoir plans identified during preliminary studies. FY 88 study funds would be used to continue detailed studies.

The Board of County Commissioners of Douglas County has stated their strong support for continuation of detailed studies, as well as their willingness to participate in detailed study and construction cost-sharing.

## Willamette River Basin, Oregon

The Willamette River Basin in northwestern Oregon is about 160 miles in length and contains about 12,000 square miles. Although the basin has only about one-eighth the area of Oregon, it is home to nearly two-thirds of the state's population.

While total water yield of the basin appears to be adequate to meet present and foreseeable needs, there are streamflow problems with flooding in the winter and shortages in the summer. The major flood of December 1964 caused damage in the basin estimated at $71 million. At current price levels, those damages would be more than six times greater. Average annual flood damages for the basin are more than $40 million at 1986 price levels.

A 1970 Level B comprehensive study of the basin established the then-existing and future water and related land resource needs, including flood damage reduction, additional water supply, and hydropower. Based on recent evaluations of the 1970 plan, and a request of the Northwest Power Planning Council to install temperature control facilities at three Corps dams in the basin, interim studies of the Mill Creek Basin, Thousand Creek Basin, and temperature control studies are underway.

FY 87 funds are being used to complete studies for a preliminary report on the Mill Creek Basin interim study, and to initiate detailed studies. Detailed study is continuing of the evaluation of Jordan Dam site on Thomas Creek. Investigation of water temperature control, including the Santiam River Basin, have been consolidated into a Willamette Basin temperature control interim study, which is continuing in FY 87. A technical report on temperature control will be completed in FY 87.

FY 88 funds would be used to continue detailed studies of Mill Creek, the Jordan Dam site, analysis of the Santiam River Basin temperature data, initiate preliminary study of multi-level water intake structures for existing Santiam and upper Willamette Basin projects, and to initiate detailed study of such structures for Santiam Basin projects.

### Malheur Lake, Oregon

Malheur Lake, the largest of three inter-connected lakes, Malheur, Mud and Harney, is located in the closed Harney Lake Basin in southeast Oregon. Greater than normal rainfall during the past five years has caused Malheur Lake to rise more than seven feet above its historic high level. High water has caused the three lakes to merge into a single, large lake covering an area of about 177,000 acres.

Through 1986, the resulting flooding has caused an estimated $21.6 million in damages to ranches, farmland, two State highways, local roads and a railroad serving the commercial interests of the City of Burns, the Harney County Seat. FY 87 funds will be used to complete detailed feasibility studies initiated in late FY 85. We expect to complete the final report in spring 1987.

### Coos Bay, Oregon

Coos Bay is a major international commercial navigation port located on the southern Oregon Coast. The existing commerce is related to the forest industry, and has averaged more than five million tons per year from 1976 through 1985.

The existing Federal deep-draft channel is inadequate to accommodate vessels calling on the Port. Consequently, vessels experience delays while awaiting high tides or must be light-loaded. In addition, the Southern Pacific Co. railroad bridge is restrictive and imposes costly delays on shippers because river pilots will not transit the narrow bridge opening during darkness. Because of rough entrance conditions and lack of suitable in-bay anchorage, vessels must wait at sea or port for favorable conditions before entering or leaving the project area.

FY 87 funds are being used to initiate and complete the reconnaissance phase of the study at Federal expense. Funds requested for FY 88 will be used to initiate the feasibility phase of the study.

### Olympia Harbor, Washington

Olympia Harbor is located on the southern shore of Puget Sound at Olympia, Washington. The Port of Olympia is experiencing dramatic growth in waterborne commerce and presently handles about one million tons of commerce--mostly logs and wood products shipped to Pacific Rim nations. Recent trends indicate that trade will continue to increase and become more diversified.

The harbor is divided into East and West bays by a port-constructed peninsula. The 500-foot-wide by 30-foot-deep West Bay channel dredged by the Corps in 1939 is not adequate for world fleet vessels that call on the harbor. A study completed by the port in 1984 projects continued growth in commerce as well as a need for deepening the West Bay channel and turning basin.

FY 87 funds are being used to initiate and complete a reconnaissance study and report at full Federal expense. FY 88 funds will be used to initiate a feasibility phase study. The non-Federal sponsor will share 50 percent of the feasibility study costs.

## Bellingham Harbor, Washington

At Bellingham, Washington, on the northeastern shore of Puget Sound, studies will be made to determine whether the existing Watcom Creek Waterway should be deepened as requested by the Port of Bellingham.

About two million tons of commerce, mostly log shipments and ore and mineral imports, are handled annually by the Port. Vessels calling at the port draft 33 feet, exceeding the existing 30 foot channel depth. They are delayed while mooring on the tides and incur higher transportation costs. Vessel drafts are expected to increase to 39 feet in the future.

FY 87 funds are being used to initiate and complete a reconnaissance study and report at full Federal expense. FY 88 funds will be used to initiate the feasibility phase study. The non-Federal sponsor will share 50 percent of the feasibility study costs.

## South Central Region, Alaska

The South Central Region of Alaska includes all of Cook Inlet, Prince William Sound and the Gulf of Alaska from Yakutat, opposite the north-south border with Canada, to Dutch harbor on Unalaska Island in the Aleutian chain. Recent accelerated economic development of Alaskan resources has placed increasing demands on harbor facilities in the region. Further development of resources, such as potential oil fields in Lower Cook Inlet and expansion of the fishing industry, is expected to result in a need for increased deep draft navigation improvements. Current studies are addressing shoaling problems in the approaches to Anchorage harbor and the need for improvements in the Harbor.

FY 87 funds are being used to complete detailed engineering, economic, and environmental studies, and a feasibility report for the Anchorage Harbor interim in September 1987.

## Rivers and Harbors in Alaska

The Comprehensive Rivers and Harbors in Alaska study will identify current and future water resource problems and needs in Alaska in light of vast physical and economic changes within the state. Changes such as the growth and development of the mining and fishing industries have accelerated the need for navigation improvements, flood and storm damage reduction, water supply, fish and wildlife enhancement, and recreational development.

Especially significant is the impact of the Fisheries Conservation and Management Act of 1976, as amended in December 1980, which established the 200-mile fisheries conservation zone. This has been a boon to U.S. fishermen, who are dramatically increasing their fishing fleets and their take of bottomfish within the zone. This has resulted in the need for new and expanded harbors, which are being addressed by a series of bottomfishing interim studies.

Other needs are being examined under eight comprehensive interim studies for Yukon-Kuskokwim Navigation, Bristol Bay Harbor, Coastal Oil and Gas, S.E. Harbors of Refuge, Coastal Erosion, Mineral Development Navigation Improvements, Western General Cargo Harbor Development, and Tanana Basin Water Resources.

FY 87 funds are being used for bottomfishing interim reports for Atka and Akutan/Unalaska Harbors. In addition, we will complete the Yukon-Kuskokwim Report. With requested FY 88 funds, we will continue four comprehensive interims and resume the Tanana Basin study, which will focus on the needs for navigation improvements and flood damage reduction in this region.

# PRECONSTRUCTION ENGINEERING AND DESIGN

## Centralia, Washington

The Centralia Flood Damage Reduction project, as authorized by PL 99-662, will significantly reduce flooding on 17,500 acres in the Chehalis River valley, including areas in the City of Centralia and on 4,600 acres in the Skookumchuck River valley in southwestern Washington. Centralia experiences an average of $3.5 million in flood damages annually. The authorized project consists of structural modifications to an existing private dam on the Skookumchuck River to provide for flood control and wildlife mitigation.

FY 88 funds would be used to initiate preconstruction engineering and design studies.

## Homer Spit, Alaska

The City of Homer, Alaska, is located at the mouth of Kachemak Bay where the bay intersects Cook Inlet, about 120 miles southwest of Anchorage. Homer Spit, which juts out about four miles from the Kenai Peninsula, contains the economic heart of Homer, with a thriving deepwater port, fuel storage facilities, fish processing plants, recreational development, and a recently-completed 50-acre, $14 million Federal small boat harbor and a Coast Guard facility.

The spit is experiencing serious erosion which, as in the past, could cut deeply into the spit and sever the only highway connecting it to the mainland. The State of Alaska has spent more than $6 million on four major repair efforts in an attempt to prevent the spit from being severed.

The reconnaissance phase of the feasibility study, which included a completed reconnaissance report and signed cost-sharing agreement, was completed in March 1986. Detailed study of alternative solutions was initiated in April 1986. FY 87 funds are being used for the feasibility report with expected completion in March 1988. FY 88 funds would be used to initiate preconstruction engineering and design.

## Grays Harbor, Chehalis and Hoquiam Rivers

The Port of Grays Harbor in western Washington is the largest North American supplier of logs to mainland China. Improvements to the existing Federal deep-draft navigation project at Grays Harbor authorized by PL 99-662 will result in substantial transportation savings estimated to exceed $15 million annually. The project will provide for deepening and widening 24.3 miles of the existing deep-draft channel, replacement of a restrictive railroad bridge over the channel, and construction of two turning basins.

FY 87 funds are being used to complete planning and environmental studies and prepare the draft General Design Memorandum and EIS Supplement. FY 88 funds will be used to complete the final GDM and EIS Supplement in January 1988 and prepare plans and specifications for channel dredging.

## East, West, and Duwamish Waterways, Washington

The project for deep-draft navigation improvements of the East, West and Duwamish Waterways of Seattle Harbor in Washington, as authorized by PL 99-662, includes deepening and widening portions of the Federal navigation channels and a turning basin, and replacing a railroad bridge over the Duwamish Waterway.

Planning and engineering studies in progress were deferred in FY 86 at the request of the Port of Seattle. The Port adopted a harbor development strategy in August 1986 that precludes improvement of the waterways in their near-term program, but includes the project as a long-term option. As a consequence, the FY 87 Continuing Resolution Authority eliminated $750,000 for continuing CP&E studies on the East, West and Duwamish Waterways.

## Blair-Sitcum Waterway, Washington

The Blair and Sitcum Waterways project at the Port of Tacoma, Washington, as authorized by PL 99-662, would provide for the deepening of the Federal deep-draft navigation channel in the Blair Waterway, and replacement of a restrictive bridge over the waterway. The project also provides for Federal maintenance of the non-Federally-constructed Sitcum Waterway.

Funds provided in FY 87 will be used to perform bridge replacement studies. All other planning and engineering studies have been deferred awaiting the resolution of dredge disposal site locations and Indian land claims in the project area.

St. Paul Island Harbor, Alaska

St. Paul is the northernmost island of the Pribilof Island group of Alaska, which is located adjacent of fertile bottomfishing resources as well as potential oil and gas fields of the Norton, St. George, North Aleutian, and Navarin Basins. The project for navigation improvements at St. Paul, authorized by PL 99-662, includes construction of a 1,800-foot-long breakwater, an 18-foot-deep entrance channel, a maneuvering area, and a mooring area to service existing commercial and subsistence fishing fleets. The recommended project would cost about $25.6 million.

During 1984 through 1986, the City of St. Paul initiated Phase 1 of a local effort to accelerate harbor construction by opening a quarry and placing 750 feet of rock revetment in general alignment of the federally authorized project. The city desires reimbursement for their share of the project, as provided by Section 204 (e) of PL 99-662. FY 87 funds are being used to coordinate with non-Federal interests to develop a local cooperation agreement and to initiate Preconstruction Engineering and Design, including engineering, economic and environmental studies. FY 88 funds would be used to continue preconstruction engineering and design of the project.

## CONSTRUCTION

Bonneville Second Powerhouse, Oregon and Washington

The Bonneville Lock and Dam project on the Columbia River about 40 miles upstream of Portland, Oregon, consists of an initial 10-unit powerhouse of 518,000 kilowatts, and a new second powerhouse with eight units of 558,000 kilowatts which went fully on line in 1982. The total installed capacity of this project is now 1,076,000 kilowatts.

During FY 87, evaluation of the project's juvenile fish bypass system and construction of project support facilities are continuing. To protect the juvenile fish migrating down the Columbia River from losses while passing through the generating turbines, the Corps constructed a submerged traveling fish screen bypass system concurrent with completing the generating units. However, the efficiency of the screens in deflecting juvenile fish is low—only about 20 percent of the fish are deflected from the turbines into the bypass system. During the past three years we have conducted intensive field investigations to find a solution to this problem.

This year we are continuing those investigations by installing and testing additional structural modifications to the Second Powerhouse this spring. To protect juvenile fish from undue losses while this work is in progress, power generation will be limited during the period of most intense juvenile passage. We will also continue to provide supplemental spills to assist these downstream migrants past the project.

If suitable bypass solutions are found this fiscal year, FY 88 funds will be used to design modifications to the bypass system and support facilities, allowing project completion in FY 91.

We are also continuing activities at the Steigerwald Lake area to fulfill mitigation requirements for terrestrial wildlife for the Bonneville project. We have purchased 682 acres of mitigation lands, and are continuing to prepare development plans, including studying additional land or easement acquisitions to realign Gibbons Creek in cooperation with wildlife agencies.

Chief Joseph Dam, Washington

Chief Joseph Dam is on the Columbia River just upstream of Bridgeport, Washington. The initial installation of 16 generating units totaling 1,024,000 kilowatts was completed in 1958. Construction of an additional 11 units was completed in 1979, bringing the total installed capacity to 2,069,000 kilowatts.

Currently, the original 16 power units are being refurbished and uprated. This work, when completed in early FY 88, will add an additional 204,000 kilowatts, bringing the total project installed capacity to 2,273,000 kilowatts.

We continue to pursue correction of the low efficiency problem of the additional 11 turbine units at the project. Gaining the contract-required efficiency would result in $6.5 million worth of additional power each year. FY 88 program funds would be used to initiate contract work to make major changes to the turbine units necessary to correct the low efficiency problem.

## Snettisham, Alaska

The first phase (Long Lake) of the Snettisham hydroelectric project in Alaska was completed in 1976. In 1983, the Alaska Power Administration's power demand forecast for the Juneau area indicated that additional power generation at the Snettisham project would be needed in the 1986-87 time frame. In FY 84 work was begun on the second phase (Crater Lake), which provides for construction of a power tunnel from Crater Lake to the existing powerhouse, and installation of an additional 27,000-kilowatt unit. Work has been continuing since that time.

The main contract, which will complete the second phase, was awarded in August 1986. Power-on-line continues to be scheduled for February 1989.

## Lower Snake River Fish And Wildlife Compensation Plan

The Lower Snake River Fish and Wildlife Compensation Plan was authorized in 1976 to compensate for fish and wildlife losses attributed to the construction of Ice Harbor, Lower Monumental, Little Goose, and Lower Granite lock and dam projects on the lower Snake River in Idaho and Washington. The plan, currently estimated at $177 million, includes construction of nine fish hatcheries and 13 associated satellite facilities to produce annually 17 million juvenile spring, summer and fall chinook salmon, 11 million juvenile steelhead, and about 233,000 trout. The plan also includes pheasant rearing, and development of about 4,000 acres of on-project lands and about 24,000 acres of off-project wildlife lands with access for fishing and hunting.

Seven hatcheries and seven satellite trapping-acclimation facilities are operational. One additional hatchery and five satellites should be operational in FY 87. The last satellite is scheduled to be operational in 1989. The schedule for the remaining hatchery at Clearwater, Idaho, is indefinite, pending selection and design of a hatchery water supply system.

## Chena River Lakes, Alaska

The Chena River Lakes project consists of the Chena River Dam and Floodway and the Tanana River Levee in Alaska. It provides protection to Fairbanks and adjacent areas, including Fort Wainwright, from recurring flood damages from the Chena and Tanana rivers. When its gates are closed or throttled, the dam diverts flood waters from the Chena River down a floodway behind an earth dam to the Tanana River. There is no pool except during floodway operation.

FY 87 funds are being used to continue work, including completion of two groins in the Tanana River which will protect the Tanana levee. The levee and interior drainage system are scheduled to be turned over to the local interests for operation and maintenance this year. Project completion is scheduled in FY 88.

As reported last year, some flooding has occurred along the Chena River during flood control operations--mostly as a result of development since initiation of flood control efforts. The study of potential modifications to our regulatory releases, which was initiated in FY 85, is scheduled for completion in early 1987.

## Lower Columbia River Basin and Willamette River Basin Bank Protection

Bank erosion along the Lower Columbia River is confined mainly to the 125-mile reach from Washougal, Washington, to the Pacific Ocean. Projects in Oregon and Washington prevent bank erosion at critical areas; protect existing levees, industrial sites and utilities; and stabilize the river channel. Normal spring high water, wind waves and vessel waves are the primary causes of erosion.

Construction was completed at one site in FY 86, and work initiated in FY 86 is scheduled to be completed at two other locations in FY 87. We plan to initiate and complete construction at the Duncan Cove, Oregon, location in FY 87. Construction will be initiated at the Columbia Slough, Oregon, location in FY 87, with completion in FY 88. FY 88 funds will be utilized to initiate and complete construction at Prairie Channel, Oregon, and Lawton Creek, Washington, locations.

Bank protection on the Willamette River is continuing. This work is to prevent loss of property through erosion and channel changes. The Finnicum location, near Dayton, has been rescheduled from FY 86 to FY 87. One other site, at Second Lake, is scheduled for construction in FY 87. With FY 88 funds we expect to initiate and complete construction of the Bass Phase II Extension site and the East Independence Bridge site. At both of these projects we are working with the local sponsors for each separate site to develop cost sharing and financing agreements which reflect the concepts of cost sharing in the Water Resources Development Act of 1986. In addition to providing the lands, easements and rights-of-way, local interests will be required to pay in cash that amount necessary to make the local contribution equal to 25 percent of the first costs of construction. This process may delay the award of the construction contracts until the agreement is consummated with each sponsor.

## Bethel, Galena and Dillingham, Alaska

At Bethel, Galena and Dillingham, Alaska, serious erosion has threatened public and private properties at each community. The FY 86 Continuing Resolution directed emergency bank stabilization work at Bethel, Galena and Dillingham at full Federal cost, estimated at $1.5 million, within available funds previously appropriated in the 1986 Energy and Water Development and Appropriation Act (PL 99-141).

The Corps has placed rock revetment at Bethel to avert serious erosion threatening the city's bulkhead at Mission Road. Approximately 450 linear feet of rock was placed this past summer at a cost of about $550,000.

We are currently negotiating with the City of Galena to place about 1,200 linear feet of rock revetment to protect the new Galena Townsite from serious erosion. The City received a state grant of about $1.12 million to add to the Corps' $650,000 for this work, which we expect to initiate during this year's construction season.

At Dillingham, $100,000 has been approved to relocate water and sewer lines threatened by erosion. Instead, the city desires to construct an erosion control bulkhead and has requested our participation in this effort. We are currently considering their proposal.

## Mud Mountain

Mud Mountain Dam is on the White River about five miles upstream of Enumclaw, Washington. It provides flood control protection for about 7,000 acres of land, including the towns of Auburn, Kent, Sumner, Puyallup, Fife and the industrial area of Tacoma. The dam, which is an earth and rockfill structure 425 feet high with a crest length of 700 feet, was placed in operation in 1948. Based on present dollars and downstream development, the project prevents an average of $8 million in damages annually. Total damages of $2.2 billion would result from failure of the dam with the reservoir full.

The potential for internal erosion of the impervious core material within the dam was discovered during geotechnical exploration in FY 85. Subsequently, solving this problem has taken precedence over all other dam safety work on the project. A concrete cutoff wall through the center of the dam is scheduled for construction in FY 87 and will be complete by September 1989. This work is planned to be accomplished with Operation and Maintenance, General funds as a major rehabilitation project.

Other modifications are required to prevent failure due to overtopping of the dam and spillway walls during major flooding, failure of the outlet tunnel intake towers under major seismic events, and plugging of the intake towers by debris during major flooding. Planning and engineering work was initiated in FY 84, and construction to rectify these problems began in FY 86 and is scheduled to be complete by December 1992. This dam safety work will be accomplished with Construction General funds.

### Elk Creek Lake

Elk Creek Lake is one of three multipurpose storage dams authorized as the Rogue River Basin Project. It is located on a tributary of the Rogue River about 27 miles north of Medford, Oregon. Elk Creek, which includes a roller-compacted concrete dam, will be operated as a system with the completed Lost Creek and Applegate projects.

In FY 85, a contract was awarded for county road relocations. Construction of the $62.8 million dam was begun in February 1986. Foundation excavation is nearly completed and concrete placement for the regulating outlet is underway. The project will be operational for flood control in October 1988 with final completion scheduled for FY 89.

### Mount St. Helens

Material eroded from the three billion cubic yard avalanche resulting from the May, 1980, Mt. St. Helens' eruption continues to deposit in the Toutle, Cowlitz and Columbia Rivers. PL 98-63 authorized the Corps to provide flood protection in the developed areas on the Cowlitz River against a 100-year event. Flood protection is currently being provided by temporary levee structures which were constructed in Fall 1982, and dredging in the Cowlitz and Toutle Rivers to remove sediment deposition to disposal areas provided by the State of Washington. The temporary structures provide protection against a single short-duration flood. Evacuation of residents from the flood plain would be required prior to the water encroaching on these temporary structures.

A permanent solution to the sediment problem was authorized by PL 99-88 and includes: Construction of a sediment retention structure at the Green River site on the North Fork Toutle River, minimal levee improvements at Kelso, Washington, and dredging downstream from the sediment retention structure during construction of the structure and when the impoundment area has filled and sediment begins to pass over the spillway. Local sponsors are also participating in the project by providing lands, easements and right-of-way, as well as a cash contribution..

The main contract for construction of the sediment retention structure was awarded in December 1986 with project completion scheduled for September 1989. Dredging of material from the Toutle River during the winter of 1986-87 is now being accomplished. Levee improvements at Kelso, Washington, are planned for FY 88.

### New Bonneville Lock

The navigation lock at Bonneville Dam, completed in 1937, was the first major navigation lock on the Columbia River system and is the most heavily used. Because it is smaller than the locks at the seven upstream projects, it requires the breakup of normal tows, causing even more lockages. The time required for these additional lockages limits the total traffic through the lock. This bottleneck will be eliminated by a new 86-foot-wide by 675-foot-long lock which will be compatible with the upstream projects.

Planning and engineering studies were completed in FY 85. Construction started on railroad relocation in FY 86 with completion scheduled for July 87. Design of the navigation lock is continuing with the major contract for lock construction set for award in FY 88. Completion of the lock is scheduled in 1992.

## OPERATION AND MAINTENANCE

### Powerhouse Repair and Modernization

To curb an increasing frequency of breakdowns and lengthier repairs at our powerhouses, we continue to repair and modernize aging power generating equipment. Repair and modernization work at McNary Dam on the Columbia River three miles east of Umatilla, Oregon, is being completed with FY 87 funds, while similar work at Bonneville Dam will continue with FY 87 and 88 funds.

Rehabilitation of the turbines and generators at John Day Dam on the Columbia River, 26 miles upstream from The Dalles, Oregon, will continue with FY 87 and 88 funds. Due to its size and location, the project is a key plant in the Northwest hydropower system. Because of this, the rehabilitation work is critical for efficient operation of the regional power grid.

### Anadromous Fisheries Program

To mitigate the impacts of its dams, the Corps has provided fish hatcheries, adult and juvenile fish passage facilities, water quality control structures, and special flows and spills. The Corps also funds about $2 million annually from its projects to study and evaluate improved fish passage efficiency and secure necessary information for the design, construction and operation of effective fish passage facilities. This program has been in effect since 1953.

The Pacific Northwest Electric Power Planning and Conservation Act of 1980 (PL 96-501) created the Northwest Power Planning Council and directed it to establish a Fish and Wildlife Program to protect, mitigate, and enhance fish and wildlife resources impacted by hydroelectric development. The Council approved its initial Fish and Wildlife Program in November 1982, adopted new amendments in October 1984, and is now in the process again of amending the program with final adoption scheduled for February 1987.

We are working closely with the Northwest Power Planning Council, Bonneville Power Administration, Northwest fish and wildlife agencies and Indian tribes in implementing applicable measures of the Fish and Wildlife Program through our existing authorities and available funds. The Corps' primary efforts now focus on the protection of migrating juvenile salmon and steelhead at mainstem dams on the lower Snake and Columbia rivers.

Special emphasis is being given to plans for installing juvenile fish bypass systems at Lower Monumental and Ice Harbor dams on the Snake River and The Dalles Dam on the Columbia River. We are also expediting prototype tests at the latter two projects to determine fish guiding efficiencies for potential screening systems.

We are planning to upgrade the existing juvenile fish collection facilities at Lower Granite, Little Goose and McNary dams to more efficiently handle the increased number of downstream migrating juveniles originating from hatcheries constructed through the Lower Snake River Fish and Wildlife Compensation Plan. Juvenile fish bypass facilities will be operational at all 16 units of John Day Dam by March 1987. Approximately $6.6 million is currently scheduled for juvenile fish bypass activities in FY 87.

Annual coordination of Water Budget flows and an interim juvenile fish passage plan involving special spills, powerhouse operations and transportation guidelines has been difficult, controversial and time consuming. The Corps is continuing to work on these matters and is collecting additional needed data on which to base future decisions.

The Northwest Power Planning Council has requested that the Corps review flow criteria in the Willamette River Basin, and install temperature control structures on three Corps dams in the basin.

The McKenzie River flow and temperature studies have been completed and a draft report is being coordinated with state and Federal resource agencies. After all comments have been received, a final report will be prepared and used as a decision document for future actions on the McKenzie River. The collection of field data for the Santiam River Basin has been completed, and data will be evaluated to determine effects of Corps projects in the basin and the potential for installation of temperature control structures.

## Lower Granite Reservoir Dredging

A study is underway to reduce the flood threat to Lewiston, Idaho, and hindrances to navigation caused by shoaling near the confluence of the Clearwater River with the Snake River in the Lower Granite Dam pool. Dredging and disposal of sediments may be necessary to maintain both flood control and navigation. As shoaling continues, the risk of flooding in the Lewiston area will gradually increase.

Almost 600,000 cubic yards of bottom materials were dredged in early 1986 as an interim measure. An additional 400,000 cubic yards will be removed during the winter months of 1987 from the Clearwater River to restore adequate navigation depths.

## Dredging Accomplishments

The Corps of Engineers has reduced its fleet of hopper dredges to a minimum fleet of four as prescribed by PL 95-269. This law requires the Corps to set aside an amount of work each year necessary to keep the Minimum Fleet fully operational, and the dredges must be ready to respond immediately to national defense and emergency work.

The North Pacific Division operates two of these dredges, the ESSAYONS and YAQUINA. During FY 86 they worked a total of 429 days and removed 9.2 million cubic yards of material from rivers and harbors. Another 14.5 million cubic yards of material were dredged by private industry plant under contract.

## Oregon Coastal Harbors

In FY 86, the dredge YAQUINA was very successful in maintaining Oregon coastal projects. Improvements to the jetty system at the Umpqua project and installation of pile dikes at Rogue River contributed to this success by reducing our maintenance dredging workload. Also, the dredge YAQUINA has proven to be a very effective and efficient dredge in these projects.

Last year, the YAQUINA worked in four of the major shallow-draft coastal projects (the Umpqua, Siuslaw, Coquille and Chetco rivers) for 86 days, removing more than 660,000 cubic yards of material.

## Nome Harbor, Alaska

Interim repairs to 385 feet of steel sheet pile were completed in November 1986 at Nome Harbor, Alaska. Although the work is temporary, it should provide sufficient protection to the harbor during the period a long range study is underway to determine the best overall solution to both the navigation and navigational structure problems at Nome.

## MISCELLANEOUS

### PL 84-99 Work

The Spring 1986 snowmelt runoff produced flows in the Snake River system that had the potential for extensive damage. Flows representing in excess of a 125-year event were experienced on the Snake and Gros Ventre rivers at Jackson Hole, Wyoming. Damages prevented by flood control structures exceed $11 million. Levees were damaged on the Snake and Gros Ventre rivers in Wyoming and on the Snake, Big Wood and Salmon rivers in Idaho. Estimated cost to repair the levees is $2.9 million.

Flooding in western Washington in late November caused more than $17 million in damages and, as a result, a Presidential Disaster Declaration was made. However, about $42 million in flood damages were prevented by flood control structures on the Green, Puyallup, Wynoochee and Skagit rivers. An additional $1 million in damages were prevented through PL 84-99 flood fighting activities in the Nooksack, Snohomish and Chehalis river basins at a Federal cost of $95,000.

### Puget Sound Dredged Disposal Analysis

In April 1985, the Corps began the Puget Sound Dredged Disposal Analysis (PSDDA) study - a joint cooperative effort with the U.S. Environmental Protection Agency and the State of Washington to identify acceptable dredged material disposal sites in water of the Puget Sound.

On the average, approximately 1 million cubic yards of mostly clean sediments are dredged from Puget Sound harbors each year. Unconfined openwater disposal, while significantly less expensive than other modes of disposal, has in the last several years encountered resistance due to public concerns over contaminated sediments found in some harbor areas.

The study is being accomplished in two overlapping phases. Technical studies for for Phase I have been completed and an environmental impact statement is being prepared to asses potential impacts of various alternatives and will be released for public review in early 1987. Phase I addresses disposal of dredged material in the central portion of the Sound. Phase II of the study, which is scheduled for completion in FY 88, will address open water disposal in the remainder of the Sound.

Environmental groups, Indian Tribes, local governments, Puget Sound ports, marine scientists, and other interests are actively participating in PSDDA study activities, which are being closely coordinated with EPA's ongoing Puget Sound Estuary Program and the State of Washington's Puget Sound Water Quality Authority sound-wide planning program.

### Navy Homeport, Everett, Washington

The U.S. Navy has proposed to homeport a Carrier Battle Group, consisting of 13 ships, in Puget Sound at Everett, just north of Seattle. Construction is scheduled to start in 1987. The proposed facility would occupy approximately 117 acres of previously-filled tidelands, requiring dredging and excavation of approximately 3.3 million cubic yards. Approximately 928,000 cubic yards of contaminated sediments will be dredged.

The proposed dredging and disposal plan includes clamshell dredging of the contaminated sediment and contained aquatic disposal (CAD) at a depth of approximately 350 feet. Capping of the contaminated material would be from the cleaner underlying sediments.

In 1984, the Navy contracted with the Corps for technical assistance because of the Corps' dredging expertise. Technical assistance efforts are scheduled for completion in FY 87.

The Navy filed an application in October 1985 for a Department of the Army permit for dredging in accordance with Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. The Seattle District determined that before a permit could be issued the Navy's Final EIS would have to be supplemented. The Final EIS was published by the district in November 1986 and a permit decision is expected to be made in February 1987.

## Mobilization Activities

Mobilization readiness is recognized as one of the Corps' most important responsibilities. Our civil works program, together with our military design and construction mission, keeps a strategic reserve of engineers. That strategic reserve cadre across the North Pacific Division provides a bank of engineer-related skills that can be drawn upon in times of natural as well as national emergencies.

An excellent example of this principle in action was the response to the eruption of Mount St. Helens, where quick and effective action helped reduce human suffering and restore vital services to the stricken western Washington area.

## Continuing Authorities Program

The small projects program has continued to be active in the Sections 14, 103, 107, 205 and 208 authorities.

In FY 86, construction was completed on the Section 107 small navigation authority projects at Kalama, Washington, and Mekoryuk, Alaska. Construction of three Section 14 emergency bank protection projects and two Section 208 clearing and snagging projects was completed in the states of Idaho, Oregon and Washington. Preparation of plans and specifications continues for three projects with completion scheduled in FY 87.

The study of ice jam flooding at Salmon, Idaho, was completed in FY 86 with the tentative recommendation of no Federal action under the Section 205 authority, because no projects were found with both economic feasibility and local support. The results of an ongoing experiment with ice barriers on Salmon River will be incorporated into the Salmon River study in late FY 87, at which time a final report will be prepared.

The Section 103 study of shore erosion problems at Lincoln Park Beach in Seattle, Washington, is also scheduled to be completed in FY 87.

## SUMMARY

The FY 88 program of $327,531,000 for the North Pacific Division is a 31 percent increase from the $249,249,000 allocated for the current fiscal year ending next September 30. Construction General accounts for $156,800,000; Operation and Maintenance for $163,707,000; and General Investigations for $7,024,000.

## MOUNT ST. HELENS, WASH.

Senator JOHNSTON. Thank you very much, General Robertson. We are glad to have you here as the North Pacific Division Engineer. It is a very important Division. I have just a couple of questions for you at this time and I will submit some additional questions in writing, and then I will yield to Senator Hatfield, who I am sure will have some more detailed questions than I, since he lives where you live.

I am curious about Mount St. Helens project. How much of that sediment control structure is complete now?

General ROBERTSON. The dam is about 5 percent complete, sir. The dam contract was awarded the end of last year and it is moving along very well.

### SILT DEPOSITION

Senator JOHNSTON. Does the silt continue to wash down the river each year?

General ROBERTSON. Yes, sir.

Senator JOHNSTON. Now, is the silt coming down the Cowlitz River?

General ROBERTSON. It comes down the Toutle and then into the Cowlitz, sir.

Senator JOHNSTON. Are trees beginning to grow in the Mount St. Helens area?

General ROBERTSON. In the areas where the mudflows continued down into the Toutle River basin area, sir, near the stream banks, there are some trees and small growth coming back. In fact, the reseeding that we accomplished in connection with the temporary sediment control measures in 1981 support some wildlife, including deer and elk.

However, on the major part of the debris avalanche, closer to the mountain, there is very little growth.

Senator JOHNSTON. Why is it that there is no growth up higher and you have growth down in the Toutle River area? Is there a difference in the soil composition?

General ROBERTSON. Yes, sir. The main part of the avalanche is very deep and is primarily very fine volcanic ash material. As such, it is rather sterile and its ability to retain moisture is low. Eventually we think some vegetation will come back. There are some test sections that give evidence of some long-term growth potential.

Senator JOHNSTON. What is the rate of sediment deposition resulting from the eruption?

General ROBERTSON. Sir, over the past few years it has been slower than our estimates because we have not had any major storm events up in that area. However, our estimates continue to show that with a larger amount of rainfall and higher flood events, about 15 million cubic yards per year in the early years, on the average, are expected to be deposited in the reservoir. The expected amount is greatest in the near timeframe and then will gradually taper off over time.

Senator JOHNSTON. Will this dam solve that problem when completed?

General ROBERTSON. Yes, sir; it will prove very effective as a sediment trap, but its efficiency over time depends on the rate of sediment accumulation after the dam is complete. We have in our plans the option, once the sediment retention structure and the reservoir is filled, to dredge downstream to remove additional materials from the Cowlitz River. An alternative when that time occurs might be to further raise the retention structure. This would require further study at that time.

Senator JOHNSTON. That retention structure eventually will not be filled with water; it will be all sediment behind it?

General ROBERTSON. That is correct, sir.

Senator JOHNSTON. How long do you think it will take for the sediment to consolidate? Or does it ever consolidate?

General ROBERTSON. It would consolidate and stabilize eventually, sir. Our plan is based on a 50-year project life, and that includes dredging from downstream areas in the outyears.

### ADDITIONAL SUBCOMMITTEE QUESTIONS

Senator JOHNSTON. General, if there is no objection, I have some other questions which we would like you to respond to for the record.

General ROBERTSON. Yes, sir, Mr. Chairman.

[NOTE: The following questions were not asked, but were made part of the hearing record for response by the Corps:]

## QUESTIONS SUBMITTED BY SENATOR JOHNSTON

### FUTURE BUDGETARY IMPACT OF NEW AUTHORIZATION LEGISLATION

Senator Johnston. General, can you tell the Committee how many projects were included in PL 99-662 for the North Pacific Division and the total cost of those projects?

General Robertson. Sir, a total of 21 projects for North Pacific Division were included in PL 99-662. Of that total, 19 were authorized for construction at costs totalling $1,426,990,000 of which $1,221,170,000 would be Federal and $205,820,000 would be non-federal. One project was authorized for Planning, Engineering and Design at a Federal cost of $3,370,000. One project was authorized for Federal maintenance at costs exceeding $35,000 yearly.

Senator Johnston. In the next 4-5 years, how many new starts do you see being initiated in your Division?

General Robertson. Sir, I foresee 10 new construction starts in the next 4-5 years.

Senator Johnston. What will be the impact on your annual budget request?

General Robertson. Sir, the estimated Federal first cost of the 10 potential new starts is about $245,000,000. The average annual impact would be about $50 million.

### MT. ST. HELENS, WASHINGTON, SEDIMENT CONTROL STRUCTURE

Senator Johnston. Update the Committee on the rate of sediment deposition resulting from the eruption of Mt. St. Helens. Are sediment levels greater or lesser than Corps projections?

General Robertson. Sir, the current sediment levels are less than projected. Our sediment budget projection, as set forth in the Mount St. Helens Decision Document on pages VI-6 and VI-7, which I will provide for the record, is based upon two main conditions:

1. Volcanically caused mudflow activity will continue at 1981-1985 levels for the next 50 years.
2. Hydrologic erosion of sediment will continue beyond the project life until sediment sources have been depleted.

As long as these two conditions hold, we believe our projection of the total sediment budget will prove to be accurate, that is, we anticipate that actual and projected sediment will coincide. And as regards actual sediment, I will provide for the record an updated version of Table II-1 from the Decision Document. The sediment yield at Tower Road shows a dramatic decrease beginning in water year 1985 and continuing for water year 1986 and, thus far, for water year 1987.

## SEDIMENT BUDGET DEVELOPMENT

The 550 mcy erosion forecast presented in Appendix A was used to evaluate the alternatives in this report and is based on two main conditions:

1) Volcanically-caused mudflow activity will continue at 1981-1985 levels for the next 50 years.

2) Hydrologic erosion of sediments will continue beyond the project life until sediment sources have been depleted.

Volcanically-caused mudflows and the resulting erosion is estimated to continue at the observed average rate of 5 mcy per year, removing 250 mcy from the avalanche over the next 50 years. This mudflow activity will keep stream channels upstream from Coldwater Creek unstable, contributing, in part, to an additional 75 mcy of hydrologic erosion. In addition, hydrologic erosion of non-mudflow related sediments is primarily expected to occur downstream from Coldwater Creek. This will result in the erosion of 115 mcy of avalanche and alluvial deposits, for a total of 440 mcy. The above estimates were reviewed by expert consultants and, as a result of their comments following their review, the overall estimate was increased by 25 percent (110 mcy) to 550 mcy. The table below summarizes the sediment budget calculation.

### TABLE VI-3
### SEDIMENT SOURCES AND VOLUMES
(Based on E Budget)

| Source | Sediment Yield (Volume, mcy) | (% of Total 550 mcy Budget) |
|---|---|---|
| Mudflow generated | 250 | 45% |
| Hydrologic erosion upstream from Coldwater Creek (Related in part to mudflow activities) | 75 | 14% |
| Hydrologic erosion downstream from Coldwater Creek | 115 | 21% |
| Incorporation of consultants review | 110 | 20% |
| | 550 | 100% |

## TABLE II-1
## SEDIMENT MOVEMENT AND STREAMFLOW IN THE TOUTLE/COWLITZ/COLUMBIA SYSTEM FOR WY 1981 THROUGH 1987

| LOCATION | WATER YEARS | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 |
| LT-3 Dredging<br>Sediment Removed From Transport 4/ | 5/ | 0 | 0 | 0 | 0 | 0.7 mcy | 0.4 mcy 1/ |
| Tower Road 2/ | | | | | | | |
| (Toutle RM 6.5) | | | | | | | |
| Sediment Yield | 27 mcy | 36 mcy | 33 mcy | 21 mcy | 8 mcy | 6.5 mcy | 3 mcy 1/ |
| Streamflow 3/ | 6/ | 1.8 | 1.8 | 1.7 | 1.3 | 1.3 | 0.8 |
| LT-1 Dredging | | | | | | | |
| (Toutle RM 1.9-3.3) | | | | | | | |
| Sediment Removed | 5/ | 0 | 3 mcy | 5 mcy | 3 mcy | 0 | 1 mcy |
| Cowlitz River<br>Deposition | 5/ | 10 mcy | 5 mcy | 3 mcy | -3 (Scour) | 2 (Scour) | -2 1/ |
| Cowlitz River<br>Sump Dredging | 5/ | 3 mcy | 4 mcy | 3 mcy | 2 mcy | 0 | 0 |
| Cowlitz River<br>Yield to Columbia | 5/ | 23 mcy | 21 mcy | 10 mcy | 6 mcy | 4.5 | 6/ |

1/ Partial year, October through February estimate.

2/ Measured suspended sediment tonnage converted to cubic yards based on 95 lb/ft3. Sediment yields include measured suspended sediment plus estimated unmeasured load. This multiple is lower than 110 lb/ft3 in-place density prior to erosion because, after transport, the material is redeposited in a loose, poorly-graded condition.

3/ In millions of acre-feet.

4/ Approximately 3 mcy was excavated at LT-3 in WY86, but only 0.7 mcy of sediment was removed from the inflowing sediment load.

5/ Emergency Dredging.

6/ Insufficient data for estimate.

Senator Johnston. What makes up the $48 million of unscheduled work?

General Robertson. Sir, the unscheduled work relates to future dredging requirements that may exist downstream of the sediment retention structure, and it is a function of the future sedimentation conditions.

Senator Johnston. I note that there is nearly $19 million requested for FY 1988 for dredging. Could you explain this item in more detail and discuss the level of dredging projected in future years?

General Robertson. Sir, large amounts of sediments remain trapped in the stream beds of the Toutle and Cowlitz Rivers downstream of the site of the Sediemnt Retention Structure. As part of the permanent project, we will remove portions of these materials from the Cowlitz River by dredging in order to provide authorized 100 year flood protection based on the permanent levee system. This dredging work will be accomplished with funds requested in Fiscal Year 1988, and will be initiated after the coffer dam is complete and is effectively blocking sediments from moving into the downstream river channel areas. Following this dredging, we do not expect a requirement to dredge during the effective life of the sediment retention structure. As I indicated, depending on hydrologic conditions, some additional dredging may be required in the future as the sediment retention structure becomes filled with sediment.

## MUD MOUNTAIN DAM, WASHINGTON

Senator Johnston. Bring the Committee up to date on the dam safety problems related to Mud Mountain Dam in Washington.

General Robertson. Sir, Mud Mountain Dam, which became operational in 1948, presently provides flood control protection for about 850 acres of land on the White River and approximately 6,200 acres on the Puyallup River. The existing spillway is inadequate based on current criteria. Potentially, the dam could be overtopped and could fail. The resulting flood would inundate the White and Puyallup Rivers and could cause flow into the adjacent Green River Valley. Our proposed modifications include raising the height of the Dam and adding walls along the spillway to respond to these problems. A recently completed earthquake study indicated that both the 9-foot and 23-foot diameter tunnel intake towers would fail during a large earthquake, blocking the tunnels and causing the pool to rise. We are currently investigating modifications and replacement facilities to assure a safe and effective project control outlet and intake tower structure. In addition to the initial dam safety concerns, our recent geotechnical investigations have verified unacceptable seepage conditions within Mud

Mountain Dam's core materials. Field data indicates that fine material is being washed out of lower portions of the core over time by seepage action and/or by flushing action from reservoir fluctuations. Evaluation of all data accumulated to date indicates that the core of the dam is not performing as a reliable seepage barrier, and remedial measures are required for positive seepage control. We expect to award a contract this summer to install a concrete cut-off wall in the center of the core of the dam to correct the seepage problems.

Senator Johnston. Why isn't the major rehabilitation work to correct seepage problems being done under the dam safety project?

General Robertson. Sir, the seepage problem is symptomatic of deterioration of the core of the dam over a long period of time. Major Rehabilitation, using Operations and Maintenance funds, is considered the appropriate program for this work.

Senator Johnston. Why is the Corps planning to allocate only $1,100,000 of the $4,000,000 appropriated for the current year?

General Robertson. Sir, the $4,000,000 that was requested and appropriated for FY 1987 included construction on several elements of the dam safety project. However, the urgent need for corrective action on dam seepage has taken precedence and delayed work on dam safety design and construction.

## CITY OF CASCADE LOCKS

Senator JOHNSTON. I will now yield to Senator Hatfield.

Senator HATFIELD. Thank you, Mr. Chairman.

Welcome, General Robertson, to the hearing here today. I will just raise one or two questions very briefly and then I, too, will have some more questions to submit to you for more detailed response.

One has to do with Cascade Locks and the supply of electricity there for the Cascade Locks community, which has created a great deal of local concern. According to my understanding, it does appear to be a policy or an announcement by the Corps that should be reviewed. I think my questions in writing will identify more precisely the points I wish to have you respond to on that issue.

## BONNEVILLE NAVIGATION LOCK, OREG.

The other issue has to do with the Bonneville Lock. As I understand, the contract for excavation is to be let in 1987, and I believe it was the month of June 1987. Is that correct?

General ROBERTSON. That is correct, sir.

Senator HATFIELD. Are you still on schedule on that?

General ROBERTSON. Yes, sir; we are.

Senator HATFIELD. Then I understand that the second phase of that would be the single contract for construction of the lock that should be awarded in 1988.

General ROBERTSON. That is correct, sir.

Senator HATFIELD. What part of 1988 would that be?

General ROBERTSON. September, Senator.

Senator HATFIELD. Therefore, I suppose the obvious followup question would be: Is there sufficient money requested in the 1988 fiscal year budget to satisfy contractor earnings that would be required during that fiscal year?

General ROBERTSON. Yes, sir; we are sufficiently funded with our fiscal year 1988 budget request of $40 million.

Senator HATFIELD. For construction?

General ROBERTSON. Yes, sir.

Senator HATFIELD. Now, is there any way that the overall schedule could be expedited?

General ROBERTSON. No, sir. We have studied that very carefully, trying to find a way to accelerate it, but we are on a very tight schedule.

The schedule takes into account physical constraints such as the limitations on in-water work and the sequential scheduling of construction. There are only certain periods of the year in which we can allow the contractor to excavate for the lock in the water and to construct the groins in the entry channel.

It is a very tight schedule, sir. We do not think there is any way we can expedite it.

Senator HATFIELD. So you would say the engineering of the project requires the current schedule; your current schedule is related solely, then, to the engineering requirements.

General ROBERTSON. Yes, sir; the construction schedule is based on engineering considerations.

Senator HATFIELD. There are no budgetary ways in which we could expedite or accelerate this project?

General ROBERTSON. No, sir; I do not believe there is.

Senator HATFIELD. It is all engineering.

General ROBERTSON. Yes, sir.

Senator HATFIELD. And you are operating in that area up to the ultimate capability within the timeframe.

General ROBERTSON. Yes, sir.

## ADDITIONAL PREPARED QUESTIONS SUBMITTED FOR THE RECORD

Senator HATFIELD. Thank you very much. I do have, as I say, some further questions.

General ROBERTSON. Yes, sir.

[NOTE: The following questions were not asked, but were made part of the hearing record for response by the Corps:]

## QUESTIONS SUBMITTED BY SENATOR HATFIELD

Senator Hatfield. General, I requested from the Corps an analysis of the limitations on your legal authority to continue the existing power service. The response I received from the Portland District Engineer cited the Bonneville Act of 1937 and the Flood Control Act of 1944 as the primary limitation on the Corps' being able to retain the existing agreement. The important assumption in this citation is that the fish hatchery is a Bonneville Project facility which can be served with project power.

Please explain in detail the analysis process that led to your conclusion that the power service to the hatchery was a Bonneville project facility which can, or should, be served with project power.

General Robertson. The Bonneville Fish Hatchery facilities were acquired by the U.S. Government in 1972 to provide mitigation for anadromous fish adversely impacted by higher pool elevations required for the Bonneville project upon completion of the second powerhouse as well as for the construction of the John Day Lock and Dam.

The Bonneville Fish Hatchery is a Corps-owned facility located within the confines of the Bonneville Project. The Bonneville Project Act of 1937 was the initial operating authorization for the Bonneville Lock and Dam. Section 5 of the 1944 Flood Control Act (16 U.S.C. 825s) authorized the Secretary of the Army to reserve power for operation of reservoir projects.

Senator Hatfield. Throughout the District Engineer's report to me (which is undated, though received by my Portland Office on February 4, 1987), it is asserted that reliability of the power service to the hatchery has been uncertain through the years. Documents included in your Feature Design Memorandum No. 12 (December 1986), particularly those provided by the Oregon Department of Fish and Wildlife, list power outages to the hatchery. The city asserts that the question of reliability was never raised directly with them until earlier this year. I note, however, roughly 40 percent of the outages noted were scheduled outages.
Please clarify for me how you determined from the record in Design Memo No. 12 that reliability of the City's service was in question.

General Robertson. Design Memorandum No. 12 includes two letters from the Oregon Department of Fish and Wildlife (pages C-9 and C-11) which address City power reliability. The City agreed with the analysis that their system was unreliable, as evidenced by their August 9, 1983 letter to BPA acknowledging outage problems, published on page C-12 of the Design Memorandum. That letter identifies the scheduled and unscheduled outages.

While the City has been aware that maximum permissible power outage for the fish hatchery is 5 minutes between November and January, and 15 minutes during the remainder of the year, they have not initiated any corrective work.

Senator Hatfield. The City of Cascade Locks has proposed to install dual underground cables from the new Acton Substation to the fish hatchery. In light of this new system, the question of reliability, even if it was uncertain in the past (though I'm not sure this has been established), would appear to be rendered moot.

To date, I have seen no writen response to the City's offer to lay the underground cables. Would such a system assure a higher level of reliability to the service?

General Robertson. While the City's plan does improve upon the reliability of the existing system, it would not provide the desired level of reliability as set forth in Desigh Memorandum No. 12. By contrast, the government system will be supplied directly from the project with full reliability provided by the project generation system.

Senator Hatfield. In reviewing correspondence between the Corps, the BPA, and the City since last June, I am struck by the Corps apparent reluctance to incorporate valid recommendations into the decision-making process.

Please outline the coordination process established to receive and incorporate, where appropriate, suggestions and comments made by the City about this process.

General Robertson. The coordination process with representatives of the city involved many meetings, correspondence, proposals, and counter-proposals. All city input was seriously considered. In describing alternatives considered, the City's proposals for power service were detailed in Design Memorandum No. 12, along with reasons and determinations for their withdrawal by the City or rejection in favor of another plan. Pertinent correspondence and notes of meetings indicating the City's involvement and Corps recognition of their input are also contained in Appendix C to Design Memorandum No. 12. None of the City's proposals were either feasible or economically competitive with the Government plan. We delayed our lock construction power and hatchery power supply investigations for approximately one year in order to give full consideration to the City's proposals.

Senator Hatfield. On Page 1-2 of the Design Memorandum, it is claimed that "BPA is in agreement with the technical design concepts presented in this report".

Please provide me with written documentation of the BPA's agreement with these concepts. I am particularly interested in documentation which establishes that BPA was provided the opportunity to comment on the design concepts as they were being developed.

General Robertson. Letters from BPA dated 31 October 1986 and 18 November 1986 indicate their agreement with the technical design concepts in the report. Copies of those letters are published on pages C-50 and C-58 of the Design Memorandum. In addition, BPA was provided opportunity to comment on the design concepts as they were being developed, as evidenced by their October 23, 1985 letter and Corps' reply of February 6, 1986 (pages C-20 and C-31 respectively in the Design Memorandum). This coordination effort continued throughout the process as indicated by BPA letters of 31 October 1986 (page C-50) and 18 November (page C-58), as well as the Corps' letters of 7 August 1986 (page C-39) and 4 November 1986 (page C-56). Copies of all of these letters follow:
(The information follows:)

**Department of Energy**
Bonneville Power Administration
Lower Columbia Area
P.O. Box 3621
Portland, Oregon 97208 - 0999

October 31, 1986

In reply refer to: OPE

Mr. Robert P. Flanagan
Chief of Engineering Division, NPPEN
U.S. Army Corps of Engineers
P. O. Box 2946
Portland, OR 97208-2946

Dear Mr. Flanagan:

The Bonneville Power Administration has done a thorough preliminary engineering investigation for the different options for the replacement of BPA's South Bank Substaton as a result of the Corps of Engineers construction of the second navigation lock at Bonneville Dam. Listed below are the different options and associated costs:

| | |
|---|---|
| 1. Permanent Tanner Creek Substation (A) | $741,000. |
| Permanent 115-kV Tap Line to the Bonneville-Hood River 115-kV Line | $188,000. |
| Total | $929,000. |
| 2. Permanent Tanner Creek Substation (B) with 115-kV Bonneville-Hood River line terminated in the substation | $788,300 |
| Permanent 115-kV Line deadend tower within Tanner Creek Substataion (No 115-kV Tap Line is needed) | $130,000. |
| Total | $908,300. |
| 3. Temporary Construction Substation on Robins Island | $827,000. |
| Temporary 115-kV Tap Line to the Bonneville Dam powerhouse | $101,000. |
| Relocate temporary Construction Substation to Tanner Creek site and make it a permanent installation | $494,000. |
| Remove the temporary 115-kv Tap Line to the temporary Construction Substation | $ 24,000 . |
| Total | $1,446,000 |

If the Bonneville Power Administration is to construct these facilities, we recommend that the permanent Tanner Creek Substation and the permanent 115-kV line facilities (option 2) be built rather that building the temporary facilities in the spring of 1987 and then relocating them to the Tanner Creek site in 1992 because of less cost. Please note the relocation and removal costs are based upon known 1986 existing design, labor and material costs The actual costs for relocation in 1992 will be higher. Another thing that concerns the Bonneville Power Administration is the availability of the Tanner Creek site in 1992. Political and other special interest group concerns may eliminate the availability of this site.

Due to the short time frame we have to work within, the Bonneville Power Administration needs a decision as to which of the above options should be constructed by BPA from the Corps of Engineers by November 14,1986 in order to meet a spring 1987 completion date. Our design work needs to start by November 17, 1986 in order to meet the 1987 spring date.

**Department of Energy**
Bonneville Power Administration
Lower Columbia Area
P.O. Box 3621
Portland, Oregon 97208 - 0999

November 18, 1986

In reply refer to: OPE

The Bonneville Power Administration has the material and manpower available to design and construct either a permanent Tanner Creek Substation or a temproary construction substation on Robins Island along with the associated 115-kV transmission line facitities by the spring of 1987. The construction of the permanent Tanner Creek facilities will need more time compared to the construction of the temporary facilities. A May 1987 date is more realistic for the permanent facilities. We can only put a 40 day hold on the material that has been identified for this project. If no decision is reached to use this material within the 40 days, the material will be released for use on other projects in our system.

The above estimated costs do not include costs for the powerhouse power circuit breaker modifications which will be necessary for the temporary Construction Substation, for any 13.8-kV distribution lines, or for BPA's plans to remove equipment from the existing South Bank Substation. They do include costs for three complete 13.8-kV feeder positions for both substations.

The Bonneville Power Administration has done a preliminary review of the environmental impacts for these different options. Although some mitigation may be necessary, neither site appears to present significant environmental problems. We will continue consultation with the U.S. Forest Service to insure their agreement and ultimate approval of the desired permanent site.

Attached for your review is a draft 1398 Agreement which will need to be finalized and signed by the Corps of Engineers before BPA can proceed on this project. This same type of agreement was used with the Corps' contractor, Guy F. Atkinson Construction Co., to revise the 13.8-kV cables in South Bank Substation in October 1986. As we have stated before, the Bonneville Power Administration looks at this as a very viable project and looks forward to working with the Corps and the City of Cascade Locks to complete this project on time.

Sincerely,

George E. Gwinnutt
Lower Columbia Area Manager

Enclosure

cc:
Ken Hobson
City of Cascade Locks

Neal R. Hanson
US Army Corps of Engineers

U.S. DEPARTMENT OF ENERGY—BONNEVILLE POWER ADMINISTRATION

# AGREEMENT

| | | | | |
|---|---|---|---|---|
| 1. AGREEMENT NO.<br>DE-AP-79-86BPXXXX | 1A. AGREEMENT TYPE:<br>( ) Interagency<br>(X) Intraagency<br>( ) Intergovernmental<br>( ) Customer | MODIFICATION NO.<br>0 | 2. EFFECTIVE DATE<br>See date in Box 15 below | 3. PROCUREMENT REQUEST NO.<br>XXXX |

4. ISSUED TO:

U. S. Army Corps of Engineers
319 S.W. Pine
P. O. Box 2946
Portland, OR 97208-2946

5. ISSUED BY:

U.S. Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

6. PRINCIPAL CONTACTS

Technical: David C. Shank
Phone: (503) 221-6913
Administrative: Robert P. Flanagan
Phone: (503) 221-6916

7. PRINCIPAL CONTACTS

Technical: Jerry Mohr
Phone: (503)230-5237
Administrative: Robert J. Gilbert
Phone: (503)230-5235

8. THIS AGREEMENT WAS NEGOTIATED PURSUANT TO:

☒ 31 U.S.C. 686(a) (Federal)
☐ 16 U.S.C. 832a(l) (Customer)
☐ 16 U.S.C. 832g (Other)
☐ ______

9. ACCOUNTING INFORMATION (BPA USE ONLY):

10. TITLE AND BRIEF DESCRIPTION OF WORK TO BE PERFORMED UNDER THIS AGREEMENT:

At the U. S. Army Corps of Engineers' expense, construct ______________________, which will replace the Bonneville Power Administration's South Bank Substation.

DRAFT

The following documents are attached to and become a part of this Agreement:

The attached duties and responsibilities letter agreement from BPA to the Corps of Engineers dated November __, 1986 is a part of this Agreement.

If this is an Intergovernmental or Customer Agreement, the provisions on the reverse of this form are a part of the Agreement.

11. AMOUNT TO BE PAID BY BPA: $______

Submit SF-1081 or other invoice to:

Division of Fiscal Accounting and Disbursement—DT
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

12. AMOUNT TO BE PAID BPA: $______ (estimated)

Accounting Information: ______

SF 1081 to be submitted to:

Name Robert P. Flanagan
Address U. S. Army Corps of Engineers
P. O. Box 2946, NPPEN
Portland, OR 97208-2946

13. EFFECTIVE PERIOD OF AGREEMENT:

This Agreement will be effective from the date in Block 2 until completion of work

14. SIGNATURE OF PARTICIPANT:

BY: ______ DR

15. U.S. DEPT. OF ENERGY, BONNEVILLE POWER ADMINISTRATION

BY: ______

| | | | |
|---|---|---|---|
| NAME AND TITLE OF SIGNER (Type or Print)<br>Robert P. Flanagan<br>Chief of Engineering Division | DATE SIGNED | NAME AND TITLE OF SIGNER (Type or Print)<br>Wallace E. Helm<br>Chief of Program Control | DATE SIGNED |

BPA 1306 AUG 1983

**Department of Energy**
Bonneville Power Administration
Lower Columbia Area
P.O. Box 3621
Portland, Oregon 97208 - 0999

November 18, 1986

In reply refer to: OPE

Colonel Gary R. Lord
Commander, Portland District, NPPDE
U.S. Army Corps of Engineers
P.O. Box 2946
Portland, OR 97208-2946

Dear Colonel Lord:

This is in response to Bonneville Power Administration's (Bonneville) letter from George E. Gwinnutt to Robert P. Flanagan dated October 31, 1986, and to the U.S. Army Corps of Engineers (Corps) letter from Robert P. Flanagan to George E. Gwinnutt dated November 5, 1986, concerning the relocation of South Bank Substation as a result of the construction of the second navigation lock at Bonneville Dam. The purpose of this letter is to outline the engineering and construction responsibilities of each party.

A. Duties of Bonneville Power Administration

1. Bonneville, at its own expense, will remove and relocate where applicable the electrical facilities at South Bank.
2. Bonneville will provide separate 13.8-kV feeders for the City of Cascade Locks and for the Corps from the new Tanner Creek Substation as is presently provided from South Bank Substation.
3. Bonneville, at Corps expense, shall provide design, furnish the necessary labor and materials, and;
   - a. obtain the necessary permits and clearances from the U.S. Forest Service and the State and Federal Highway Departments for construction of Tanner Creek Substation,
   - b. construct the Tanner Creek Substation with two 13.8-kV feeder positions, and construct the 115-kV Tap to the Bonneville-Hood River 115-kV line, and
   - c. test and energize the facilities installed in Tanner Creek Substation.
4. Bonneville, at its own expense, shall operate and maintain the Tanner Creek Substation and associated 115-kV Tap line installed herein.

B. Duties of U.S. Army Corps of Engineers

1. Corps at its own expense shall provide design, furnish the necessary labor and materials, and;
   - a. construct where applicable 13.8-kV lines on the Bonneville Project, and
   - b. test and energize the facilities installed in Section B.1. of this agreement.
2. The Corps at its own expense shall operate and maintain the 13.8-kV facilities installed in Section B.1. of this agreement.

C. Ownership of Facilities

1. Title to and ownership of the facilities installed under Section B by the Corps pursuant to this agreement shall be and remain with the Corps. Title to and ownership of the facilities installed under Section A by Bonneville pursuant to this agreement shall be and remain with Bonneville.

The cost of the Corps' portion of this project in Section A.3, including overhead charges, has been estimated by Bonneville to be $908,300. Upon completion of construction, Bonneville will bill the Corps for actual costs plus applicable overhead charges. The energization date of Tanner Creek Substation and the associated 115-kV Tap line will be eight months after execution of the BPA 1398 Agreement.

If you agree with the above terms and conditions, please sign and date in Block 14 of the two attached agreement forms (BPA 1398) and both copies of this letter, and then return all to this office. An original agreement form and letter will be returned to you for your records following the approval of BPA's authorized official.

Sincerely,

George E. Gwinnutt

George E. Gwinnutt
Lower Columbia Area Manager

APPROVED:____________________________
Colonel Gary R. Lord
Commander, Portland District
U.S. Army Corps of Engineers

DATE:________________________________

Enclosure:
Two originals of Agreement Forms 1398

cc: Congressman Robert F. Smith
Senator Mark O. Hatfield

U.S. DEPARTMENT OF ENERGY—BONNEVILLE POWER ADMINISTRATION

# AGREEMENT

| 1. AGREEMENT NO. | 1A. AGREEMENT TYPE: | MODIFICATION NO. | 2. EFFECTIVE DATE | 3. PROCUREMENT REQUEST NO. |
|---|---|---|---|---|
| DE-AP-79-86BP42229 | ( ) Interagency<br>(X) Intraagency<br>( ) Intergovernmental<br>( ) Customer | 0 | See date in Box 15 below | 42229 |

**4. ISSUED TO:**

U.S. Army Corps of Engineers
319 SW Pine
P.O. Box 2946
Portland, OR 97208-2946

**5. ISSUED BY:**

U.S. Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

**6. PRINCIPAL CONTACTS**

Technical: David C. Shank
Phone: (503) 221-6913
Administrative: Neal R. Hanson
Phone: (503) 221-6408

**7. PRINCIPAL CONTACTS**

Technical: Jerry Mohr
Phone: (503) 230-5237
Administrative: Robert J. Gilbert
Phone: (503) 230-5235

**8. THIS AGREEMENT WAS NEGOTIATED PURSUANT TO:**

☐ 31 U.S.C. 686(a) (Federal)
☐ 16 U.S.C. 832a(f) (Customer)
☐ 16 U.S.C. 832g (Other)
☒ 31 U.S.C. 1535

**9. ACCOUNTING INFORMATION (BPA USE ONLY):**

**10. TITLE AND BRIEF DESCRIPTION OF WORK TO BE PERFORMED UNDER THIS AGREEMENT:**

At the U.S. Army Corps of Engineers' expense, construct Tanner Creek Substation and associated 115-kV Tap line.

The following documents are attached to and become a part of this Agreement:

The attached Division of Responsibilities Letter Agreement from Bonneville to the U.S. Army Corps of Engineers dated November 18, 1986 is a part of this Agreement.

If this is an Intergovernmental or Customer Agreement, the provisions on the reverse of this form are a part of the Agreement.

**11. AMOUNT TO BE PAID BY BPA: $**

Submit SF-1081 or other invoice to:

Division of Fiscal Accounting and Disbursement—DT
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

**12. AMOUNT TO BE PAID BPA: $** 908,300 (estimated)

Accounting Information:

SF 1081 to be submitted to:

Name Colonel Gary R. Lord
Address U.S. Corps of Engineers
P.O. Box 2946, NPPDE
Portland, OR 97208-2946

**13. EFFECTIVE PERIOD OF AGREEMENT:**

This Agreement will be effective from the date in Block 2 until completion of work

**14. SIGNATURE OF PARTICIPANT:**

BY:

**15. U.S. DEPT. OF ENERGY, BONNEVILLE POWER ADMINISTRATION**

BY:

| NAME AND TITLE OF SIGNER (Type or Print) | DATE SIGNED | NAME AND TITLE OF SIGNER (Type or Print) | DATE SIGNED |
|---|---|---|---|
| Colonel Gary R. Lord<br>Commander, Portland District<br>U.S. Corps of Engineers |  | Wallace E. Helm<br>Chief of Program Control |  |

BPA 1298 AUG. 1983

**Department of Energy**
Bonneville Power Administration
Lower Columbia Area
P.O. Box 3621
Portland, Oregon 97208

In reply refer to: OPE

October 23, 1985

Colonel Gary R. Lord, Commander
U. S. Army Corps of Engineers
P.O. Box 2946, DE
Portland, Oregon 97208-2946

Dear Colonel Lord:

Since the Corps of Engineers (Corps) has recently received authorization to proceed with the construction of the proposed second navigational lock at Bonneville Dam, we would like to work with you and your staff to address our concerns regarding continuity and quality of electrical service to the City of Cascade Locks during the construction phase and after completion of the navigational lock. Specifically we have an interest in the following:

1. Temporary electrical service to the City of Cascade Locks during relocation of the Union Pacific Railroad and during construction of the second navigational lock.

2. The Corps' plan to utilize BPA's 13.8-kV power house No 1. cables to serve a temporary substation located south of the navigational lock construction area while maintaining service to the City of Cascade Locks.

3. The time schedule for the different construction phases of the navigational lock.

4. The timing of transfer of ownership of BPA's South Bank Substation and 13.8-kV cables to the Corps. Also, what material is to be transfered.

5. The operation and maintenance responsibility of the interconnected 13.8-kV facilities during and after construction.

6. The location and engineering design of the permanent point of delivery facilities available to serve the City of Cascade Locks.

We look forward to working with the Corps to provide service to the City of Cascade Locks during and after construction of the second navigation lock.

Sincerely,

George E. Gwinnutt

George E. Gwinnutt, Manager
Lower Columbia Area

February 6, 1986

Engineering Division (EN-D-E)

George E. Gwinnutt, Manager
Lower Columbia Area
Bonneville Power Administration
Post Office Box 3621
Portland, Oregon 97208

Dear Mr Gwinnutt:

We appreciate your offer to coordinate work involved with necessary power facility changes during construction of the new lock at Bonneville Dam. As discussed with Jerry Mohr of your staff, we are currently preparing a design concept report for submission to Corps headquarters. That report will address the concerns you outlined in your October 23, 1985, letter.

In conjunction with your staff and the City of Cascade Locks, we have investigated three general options to provide electrical service to BPA and to our loads, in lieu of utilizing the existing South Bank Substation. As you know, this substation will need to be removed during the lock excavation. The projected date for the substation removal is July 1, 1987. The three options are:

- Relocate the 13.8kV system to provide power to BPA and the Corps systems.
- Replace South Bank Substation with a 115kV substation to be fed from BPA's "BONNEVILLE - HOOD RIVER" transmission line.
- Replace South Bank Substation with a new 13.8kV transmission line from the City of Cascade Locks.

We are presently focusing on two specific proposals. The first: replace the existing feeders to the South Bank Substation and extend them to serve our loads on the Oregon shore of the Bonneville project. From these station service feeders, and a new Corps substation, we would supply power to BPA at 13.8kV, as we presently do for the South Bank Substation. BPA would need to relocate the existing South Bank Substation isolation transformers for service to the City of Cascade Locks.

The second: relocate the city's "Pyramid" 115kV substation to a site near Bonneville Dam. Modifications would be required to tap the "BONNEVILLE - HOOD RIVER" transmission line. The City would serve its loads from this substation, and provide a second power source for construction loads on the Bonneville project.

Until permanent facilities are in place, the 13.8kV system will have to be rerouted. The extent of the temporary facilities will depend on the option selected for permanent service. We propose to negotiate the delineation of responsibilities between the Corps and BPA after approval of the selected option.

Railroad relocation work will start in July 1986. Two BPA facilities will be impacted: the power source for the aircraft beacon lights on tower FY708 of the "HANFORD-OSTRANDER" 500kV transmission line; and the 13.8kV feed to the City of Cascade Locks. We propose to serve the tower lights from our station service, as on all other BPA towers at Bonneville Dam, with the transition to be done as part of the railroad work. We also request that the 13.8kV cables feeding the South Bank Substation be transferred to the Corps in conjunction with the railroad work.

We propose to have our construction contractor temporarily reroute the 13.8kV line away from the construction area. Our contractor would be required to coordinate these activities with you, and to inform you of rock blasting schedules so appropriate steps could be taken to protect the South Bank Substation. We anticipate that blasting near the substation will be minor in nature.

The two options under serious consideration are well enough defined to ascertain that for either option, construction costs to BPA will be below $50,000. This information has been developed since October 1985, through a series of coordination meetings involving BPA, the City of Cascade Locks, and the Corps.

A copy of our design concept report will be forwarded to you at the same time it is forwarded to Corps headquarters. Data presented in this letter is for your planning use only; it will not be final until approved by headquarters. As soon as we receive further guidance, we will submit our preferred plan for your concurrence.

We look forward to working with you as changes to BPA's system, which are necessitated by construction of the new Bonneville Navigation Lock, are accomplished.

Sincerely,

Robert F. Flanagan, P.E.
Chief, Engineering Division

August 7, 1986

Engineering Division (EN-DB-E)

Robert J. Gilbert
Assistant Area Manager for Engineering (OPE)
Bonneville Power Administration
Lower Columbia Area
Post Office Box 3621
Portland, Oregon 97208-0999

Dear Mr. Gilbert:

In your letters of June 26 and July 16, 1986, you transmitted BPA's Tanner Creek Substation Project Diagram (No. 196504) and a proposed draft Division of Responsibility letter agreement covering power service changes at Bonneville Dam for our review. Both of these items were based upon a City of Cascade Locks proposal to move their "Pyramid" substation to the Tanner Creek site.

During a July 23, 1986, meeting, the City informed us that they are now withdrawing the Pyramid proposal. Jerry Mohr of your office was present at that meeting. Their decision was based on cost escalations, difficulty in obtaining required permits, and the development of other uses for the Pyramid substation. Copies of our letters to the City concerning the July 23 meeting are enclosed.

The temporary rerouting of the Cascade Locks service line from the South Bank substation is being scheduled by the Guy F. Atkinson Company as part of their Union Pacific Railroad relocation contract with the Corps. The Atkinson Company has not yet firmed up their schedule for this work. When the work schedule is available, it will be coordinated with you. Your costs for work connected with this temporary relocation will be reimbursed by our contractor (Atkinson).

It is our understanding that BPA and the City of Cascade Locks must reach an agreement outlining the precise location of the transition of ownership between your respective facilities subsequent to construction of the temporary line rerouting. We do not believe that it is necessary that we participate in drafting the BPA/City agreement.

Because we are still essentially at square one concerning permanent power service alterations at the project, and because those changes are vital to project accomplishment, we would like to meet with you during the week of August 11, 1986. At that meeting, we hope to discuss remaining alternatives for accomplishing power system changes required by the Navigation Lock construction at Bonneville and coordinate solutions to reach that objective. We also hope to clear up funding and scheduling concerns at that time. Roy Ouchida of our Electrical Design Section will call you to firm up a meeting date and time.

We hope you agree with our redirection and look forward to a meeting next week.

Sincerely,

Robert P. Flanagan, P.E.
Chief, Engineering Division

November 4, 1986

Engineering Division (EN-DB-E)

George E. Gwinnutt, Area Manager
Lower Columbia Area (OPE)
Bonneville Power Administration
Post Office Box 3621
Portland, Oregon 97208-0999

Dear Mr. Gwinnutt:

This is to acknowledge your October 31, 1986, letter transmitting Bonneville Power Administration (BPA) costs for proposed power system changes at Bonneville Project. We appreciate your assistance in providing these cost figures. We will review your draft 1398 agreement and comment separately.

You have recommended that we proceed with a permanent substation at the Tanner Creek site. Any agreement to do this would need to be based on the following:

- BPA would be responsible for all relocation requirements and agreements for service to your customer, the City of Cascade Locks (City), which is presently provided from the South Bank substation.

- BPA would provide separate 13.8kV supplies to the Corps and the City, as presently exists at South Bank substation.

- The Corps would be responsible for the feeder from Tanner Creek Substation back to the project.

- BPA and the Corps would have a transmission services ("wheeling") agreement to wheel station service power over BPA facilities to the new Corps feeder.

- The Corps will furnish station service power to all Corps-owned facilities and all project loads in accordance with the terms of the existing BPA-Corps Memorandum of Understanding (Contract No. 14-03-19250), including construction power and the Bonneville Fish Hatchery.

As you are aware, South Bank substation must be relocated due to Navigation Lock construction. Current construction schedules indicate that the new substation must be operational by June 15, 1987. The City has informed us under separate correspondence that they prefer that BPA provide a 115kV substation over all the other alternatives that have been considered.

The Corps does not have the authority to relocate your existing facilities at South Bank substation. We estimate that your relocation costs to provide new facilities on the 13.8kV system would be approximately $50,000. We plan to propose the permanent 115kV substation alternative, to utilize that more reliable source for construction power and project power during construction. Since it could be argued that this larger and more costly facility is a Corps requirement, we propose to fund the difference between the total cost and your relocation costs. Your staff has advised us that BPA budget constraints will limit the availability of BPA funds for the work. Your contribution to this work could be met by the provision of equipment you already have available on your system, that would have the same "book value" ($50,000) as your relocation costs.

We request that you retain the equipment that you have identified for use on this project. Its availability is critical for the timely completion of this work. We also request that you provide us with details, including costs, for a transmission services agreement to wheel station service power through these new facilities during the Navigation Lock construction period. We would appreciate your reply by November 12, 1986. We have discussed our approval process for the above proposals and as such we will now complete our technical report and forward it to our Division Office for their concurrence. Because of the time constraints we plan to proceed with all negotiations and agreements short of final signatures. If you have any questions, please contact David Shank at (503) 221-6913.

Sincerely,

Robert P. Flanagan, P.E.
Chief, Engineering Division

Senator Hatfield. The City asserts that in various discussions in 1984 and 1985 the Corps indicated verbally that the City was going to continue serving both the hatchery power load and the construction load for the new lock.

Is there any written record of these assurances? If these assurances were given, what process was followed to inform the City that conditions had changed?

General Robertson. No such assurances were made. There were no meetings with the City in 1984. The first meeting the the City was on October 1985 (page C-18 in Design Memorandum No. 12). Paragraph 4 of that memorandum states that: "The recommended plan will be that which, in our opinion is in the best interests of the Government." The plan that we have selected at the end of this extended coordination process with the City is the most reliable and economical one that is available to the U.S. Government.

Senator Hatfield. In a meeting last summer the question of the likely effect of a decision to discontinue the service arrangement on Cascade was raised by a member of my Portland staff with a member of the District Engineer's staff. I see no evidence that this concern was given further consideration.

What is the Corps' analysis of the impact of the termination decision on the City's ratepayers?

General Robertson. We have made no detailed socio-economic impact analysis on discontinuing the purchase of power from the City of Cascade Locks because there is no authority to provide relief to the City resulting from the economic impact of revenue losses. However, as shown in Design Memorandum No. 12, the City charged the Government $177,105 for power supplied in 1985. The City's revenues, or margin, from these billings is $50,000,ands their payment to the Bonneville Power Administration for power was the balance, or $127,105. Therefore, the City would experience a revenue loss of about $50,000 annually. They indicated in their letter of November 13,1986,(page C-70 in Design Memorandum No. 12) this revenue loss would result in a 7 percent rate increase for the City's customers. We have not evaluated the City's rate base, and therefore , we have not verified their estimates.

## ELK CREEK LAKE, OR

Senator Hatfield. What activities are underway at Elk Creek and when do you expect to complete this project?

General Robertson. Sir, the main dam contract is underway. Flood control should be available by October 1988 with the entire project completion currently scheduled for September 1990.

Senator Hatfield. Do you have sufficient funds available to conduct work currently programmed in FY 1987?

General Robertson. Sir, adequate funds are available to the Corps of Engineers in FY 1987 to fund this project. We expect that additional funds will be allocated to the project, consistent with contractor earnings.

Senator Hatfield. We understand that there has been some controversy over reservoir clearing. Please update us on this issue.

General Robertson. Sir, the proposed plan for clearing Elk Creek includes retention of trees over about 245 acres of the 1,200 acres to be inundated by the pool. The purpose is to provide habitat for fish and wildlife. The current proposal is a compromise from earlier concepts introduced by State and Federal resource agencies, which include retention of the vegetation over a much larger area. There has been local concern expressed over the effects the plan would have on downstream Rogue River water quality and future receation at the lake. A public meeting was held on 5 Nov 86 in Medford, Oregon. Evaluation by the Corps, EPA, and the Oregon Department of Environmental Quality have concluded that the effects of the retained vegetation on downstream water quality would be insignificant.

Senator Hatfield. I understand that some unfavorable foundation conditions have been found recently. Please describe what you have found and any corrective work you foresee.

General Robertson. Sir, two zones of unsuitable materials have been identified in the North abutment area of the dam foundation. Additional excavation and treatment of these areas are required to provide satisfactory constructtion of the project.

Senator Hatfield. Will this work delay completion of the project?

General Robertson. Sir, we do not expect a delay in project completion.

## MT. ST. HELENS SEDIMENT CONTROL, WA

Senator Hatfield. We are pleased to see that you have awarded construction contracts for this important project in December 1986. Please describe the ongoing work and schedules.

General Robertson. Sir, land acquisition continues and construction of the sediment retention structure is underway. The first milestone will be completion of the coffer dam in November in time to trap sediments for the 1987-1988 winter flood season. We anticipate the entire retention structure to be completed on schedule by September 1989.

Senator Hatfield. Why has the scheduled completion date for sediment retention structure been delayed from July of 1989 to September of 1989?

General Robertson. Sir, the September 1989 scheduled completion date for the sediment retention structure is based on a revised schedule developed during the preconstruction engineering and design phase of the project. It reflects the design changes that have taken place to date. The contractor has expressed an intent to complete the project at an earlier date than currently scheduled. However, until further analysis is made of the constractor's proposal, the existing schedule should be retained.

Senator Hatfield. Will the coffer dam portion of the project begin to trap sediments in November 1987?

General Robertson. Sir, at this time we anticipate that the coffer dam will trap sediments this November in time for the winter flood season.

Senator Hatfield. I note that you are scheduling dredging of the Cowlitz River in FY 1988. What is the purpose of this work?

General Robertson. Sir, there are sediment deposits in the Toutle and Cowlitz River channels downstream of the coffer dam site. This dredging will remove sediments from the Cowlitz River and achieve the authorized 100-year level of flood protection for the existing permanent levee system.

Senator Hatfield. There is some concern that this dredging should be performed in FY 1987. Have you considered this?

General Robertson. Yes, sir, we have. We do not believe that dredging from the Cowlitz River, prior to completion of the sediment retention structure coffer dam later this year, is advisable. We are proposing this dredging be done in FY 1988 when the coffer dam will be an effective trap so that storm events will not move sediments into areas dredged for permanent protection along the Cowlitz River.

Senator Hatfield. When is your scheduled completion of the Sediment Retention Structure?

General Robertson. Sir, it is currently scheduled for completion in September 1989.

## BONNEVILLE SECOND POWERHOUSE, OR & WA

Senator Hatfield. What is the status of the Steigerwald Lake Area land acquisition and development work?

General Robertson. Sir, the Corps has acquired 682 acres and is prepared to transfer 602 acres to the U.S. Fish and Wildlife service for wildlife mitigation purposes. Eighty acres will be retained by the Corps to be transferred to the port of Camas-Washougal for port and industrial uses.

Senator Hatfield. Please discuss the status of the 80 acre Gibbons Creek area with the Port of Washougal.

General Robertson. Sir, the Port of Camas/Washougal intends to purchase the 80 acres reserved for port and industrial purposes. They have inquired about the possibility of buying the land through a sales contract rather than a single payment. The Corps plans to retain the 80 acres pending purchase by the port. The Gibbons Creek realignment is being pursued by the Corps as part of the initial habitat development, in cooperation with the U. S. Fish and Wildlife Service and Washington Department of Game. Plans for the realignment have been delayed by the Fish and Wildlife Service and Washington Department of Game due to fishery concerns. It is still anticipated that construciton would be completed in FY 1988.

Senator Hatfield. Last year you reported a delay for land acquisition from September 1985 to September 1986. This year you are again reporting a delay in land acquisition from September 1986 to November 1987. Please explain why you have continued to delay land acquisition. Include within that an overall summary of the land acquisition for Steigerwald Lake.

General Robertson. Sir, all lands currently approved for acquisition at Steigerwald Lake have been acquired by the Government. Until there is a resolution of the scope of initial development, including the location for the realignment of Gibbons Creek, it is not known whether additional real estate acquisition will be required. The resolution of this problem has caused the delays in completing the potential additional land acquisition for this project from September 1985 to November 1987. The schedule assumes there will be additional acquisition requirements.

## LOWER COLUMBIA RIVER BASIN BANK PROTECTION, OR & WA

Senator Hatfield. I understand that you are requiring local cost-sharing in separable elements of this project. Will you please explain why you are taking these actions.

General Robertson. Sir, the 1986 Water Resource Development Act provides for cost sharing of separable elements of authorized projects. The individual sites of this bank protection project meet the definition of separable elements and will therefore require cost sharing by local interests.

Senator Hatfield. What is the status of working with the local interests on this project in developing cost sharing agreements?

General Robertson. Sir, we have recently contacted, both verbally and in writing, the potential sponsors for the four projects scheduled for construction in fiscal years 1987 and 1988. We have outlined to them the requirements for cost sharing as provided for in P.L. 99-662. One sponsor has indicated it is incapable of meeting these new requirements. We have not yet received responses from the other three potential sponsors.

## MALHEUR LAKE, OREGON

Senator Hatfield. Have you found a solution to the serious flood problem at Malheur Lake, Oregon, and what is the status of your study?

General Robertson. Sir, the District Engineer has completed the study and is preparing his final report. No implementable solutions to the flooding problem have been found and the final report will not contain a recommendation for project authorization. The best structual plan, Virginia Valley Canal, was not supported by the State of Oregon. A land purchase measure was found feasible but lacked local sponsorship. Relocation of the Union Pacific Railroad Branch line was found feasible but not implementable by the Corps as a singly-owned property or facility. A land leasing option was determined to be beyond the preview and authority of the Corps.

## GALLOWAY STORAGE PROJECT

Senator Hatfield. The Northwest Power Planning Council has expressed interest in releasing stored water to support a water budget to hasten juvenile fish migration in the Columbia-Snake System. Is the Corps studying any measures to help satisfy this need?

General Robertson. Yes sir, we are currently studying a reservoir project, at the Galloway site in the Weiser River Basin in Idaho that would augment flows to increase the survival of anadromous smolts in the Columbia and Snake Rivers.

## COOS BAY, OREGON

Senator Hatfield. You are starting a new study in FY 1987 at Coos Bay, Oregon. What progress is being made in FY 1987 and what will be accomplished in FY 1988?

General Robertson. Sir, we have initiated a reconnaissance study which will be completed in December 1987. In FY 1988 we will initiate the feasibility phase of the study which will be equally cost-shared with the local interests.

## SOUTH UMPQUA RIVER BASIN, OREGON

Senator Hatfield. What is the status of your study in the South Umpqua River basin?

General Robertson. Sir, based upon favorable findings in a 1985 preliminary report, we are in the second year of detailed studies of storage sites in the South Umpqua River Basin to meet winter flood control and summer flow augmentation needs. My report is scheduled for completion in September 1989. Prospects for recommending one or more storage sites appear favorable at this time.

## HOMER SPIT, ALASKA

Senator Hatfield. Please update us on the status of erosion problems affecting the spit, including any plans for temporary protection against this season's storms.

General Robertson. Sir, a January 1987 storm and exceptionally high tides forced road closure on Homer Spit, but no severe damage was incurred. There are no plans for temporary protection due to storms this season.

Senator Hatfield. Does a favorable project look likely?

General Robertson. Sir, the three revetment extension with beach nourishment alternatives evaluated in the reconnaissance phase have benefit-to-cost ratios greater than 1 to 1. In addition, alternatives other than revetment and nourishment are being evaluated in the feasibility study. A favorable project is expected.

Senator Hatfield. I understand that non-Federal interests are cost sharing 50 percent of the cost of the Feasibility Phase. Give us your views on how this participation is working out, as well as the sponsor's views if known.

General Robertson. Sir, the cost sharing agreement has been satisfactory to the Alaska Department of Transportation with the exception of the 50 percent limitation on in-kind service contribution. They have provided the cash, contracts, and in-kind service contributions required of them to date. They would have preferred more than 50% of their contribution to be in the form of in-kind services. A positive response to joint study management and to the Corp's technical assistance has been received.

Senator Hatfield. How do you propose to use the funds budgeted in FY 1988?

General Robertson. Sir, the $148,000 budget in FY 1988 will be used to initiate preconstruction engineering, and design including hydraulic and geotechnical investigations, contour mapping at the problem erosion area, and to continue the wave buoy monitoring established in the feasibility phase as part of the Alaska Coastal Data Collection program.

Senator Hatfield. Are the local sponsors willing and able to cost share in the construction of this project in accord with the requirements of PL 99-662?

General Robertson. Sir, the Alaska Department of Transportation, as the likely sponsor, signed an agreement in April 1986 to provide $470,000 in cash, contracts, and in-kind services for their half of the cost for the feasibility study. They are meeting terms of the agreement, continue to strongly support the project, and we believe they would be willing and able to cost share in construction of the project. We will negotiate a cost sharing agreement that would be executed after funds are made available for construction during the preconstruction engineering, and design stage of this project.

## COASTAL EROSION IN ALASKA

Senator Hatfield. There is considerable local interest in coastal erosion problems in Alaska. I note that you are deferring studies on coastal erosion in FY 1988. What work have you done and what conclusions have you reached so far on these studies?

General Robertson. Sir, we have visited 21 remote sites. Field inspection confirmed that communities at Kodiak, Craig, Naknek, Unalaska, Kotlik and Alakanuk are experiencing severe erosion problems affecting public facilities. There is a possibility of developing economically feasible solutions at these six sites if the coastal erosion studies are continued.

## SNETTISHAM, ALASKA

Senator Hatfield. Please update us on the status of construction of the Snettisham hydroelectric project.

General Robertson. Sir, the Phase II construction contractor is proceeding satisfactorily. The main power tunnel is within 150 feet of the lake tap, the surge tank vent has been excavated 750 feet with approximately 200 feet left. The turbine and generator contracts have been awarded and all contracts are on schedule.

Senator Hatfield. Do you anticipate being able to advance the scheduled power-on-line date of February 1989?

General Robertson. Sir, at this time we do not anticipate an earlier power-on-line than February 1989.

## PUGET SOUND DREDGE DISPOSAL STUDY

Senator Hatfield. Will you bring us up-to-date on the Puget Sound Dredge Disposal Study?

General Robertson. Sir, The Puget Sound Dredged Disposal Analysis study begun on April 1,1985 is a 3-year study of unconfined openwater disposal of dredged material in Puget Sound. Developed in response to public and agency concerns about water quality and the long-term aquatic health of the Sound, the study's goal is to provide the basis for publicly acceptable and environmentally safe plans governing unconfined dredged material disposal. The study is being undertaken as a cooperative planning effort by the Corps of Engineers, Environmental Protection Agency, Washington State Department of Natural Resources, and Washington State Department of Ecology. Total estimated study costs are $3.7 million of which the Corps is funding $2.5 million. The current status of the study is that the preferred unconfined open water disposal sites have been selected for Central Puget Sound. A dredged material inventory has been completed, with the Puget Sound ports providing information on their past, and anticipated future dredging projects. A review has been completed of existing regulatory procedures to determine what changes may be appropriate in the interest of efficiency and improved environmental protection. Preliminary draft technical appendices have been prepared and distributed for limited agency and public review. The initial draft summary report/EIS has been prepared and shortly will be ready for formal agency and public review.

## POWERHOUSE MODERNIZATION PROGRAM

Senator Hatfield. Please give the committee a rundown on the Modernization and Rehabilitation Hydropower Work underway in your Division?

General Robertson. Sir, FY 1982 was the first in a series of years we have programmed Powerhouse repair, moderniza-tion and Major Rehabilitation necessary to maintain plant reliability. This program has been successful in main-taining plant reliability. This work currently involves Bonneville Project, John Day project, and McNary project. The McNary modernization program will be essentially complete in FY 1987. In FY 1988 at Bonneville and John Day we have programmed $5,755,000 for modernizing governors, repair of turbines, generator rewind and other plant reliability items.

## DREDGING PROGRAM

Senator Hatfield. I understand you had a successful dredging season in FY 1986. Can you give me a breakdown of the dollars spent in contract dredging vs. Government Plant?

General Robertson. Sir, In FY 1986 the North Pacific Division dredged nearly 24 million cubic yards at an average cost of $1.40 per cubic yard. Our Corps hopper dredges ESSASONS & YAQUINA dredged about 10.2 million cubic yards at a cost of $15.2 million. Contract dredges removed 9.8 million cubic yards at a cost of $13.6 million. The pipeline dredge OREGON, owned by the Port of Portland, under contract to the Corps, worked in the Lower Columbia River and dredged about 3.7 million cubic yards at a cost of $4.9 million.

## JUVENILE FISH BY-PASS FACILITIES

Senator Hatfield. I am concerned about the mortality experienced by juvenile salmon and steelhead as they pass through hydropower turbines at Corps mainstem dams on the Lower Snake and Columbia Rivers as they migrate to the ocean. Would you please summarize the measures you now are using to bypass juvenile fish around the turbines?

General Robertson. Sir, we pass juvenile downstream migrants around the turbines with three basic techniques. Five of the eight mainstem dams have submerged traveling screens, installed in the turbine entrances, which deflect fish into specially constructed passages that bypass the turbines. We also use these screen systems at Lower Granite, Little Goose and McNary Dams to collect juvenile fish for direct transport by barge and truck to a release point downstream of Bonneville Dam, thus bypassing the intermediate projects. The third method is to manage spill at the projects to bypass fish over the spillway and ice and trash sluiceways rather than through the turbines.

Senator Hatfield. What do these measures cost annually?

General Robertson. Sir, we estimate that our five projects equipped with screen-type bypass systems cost about $5 million per year to operate and maintain. Transportation by barge and truck costs about $1.2 million per year. Spill costs, in the form of power revenues forgone, is the most expensive. The current spill program will cost about $13 million per year in firm power losses, but could exceed $30 million annually, depending on water conditions.

Senator Hatfield. How do you rate their effectiveness?

General Robertson. Sir, the effectiveness of screens varies considerably with species and location. Steelhead and spring chinook are deflected quite well by the screen system. In general, for these two species, screens deflect about three-fourths of available fish around the turbines. However, the screens are only about half as effective for the juvenile fall chinook species. Transportation is effective for captured fish, especially for steelhead and fall chinook. However, Fishery agencies have expressed concerns that spring chinook do not fare as well under transport conditions. Therefore, we minimize hauling of that species. Spilling water to pass fish is considered an interim solution. Because it imposes high costs in lost power revenues, it is not considered an acceptable long term bypass measure.

Senator Hatfield. What are you doing to improve effectiveness and further reduce turbine mortality?

General Robertson. Sir, we have studies and design activities underway to improve the effectiveness of existing bypass systems and studies underway to evaluate the viability of incorporating bypass measures at other mainstem projects.

Senator Hatfield. What is your basis for evaluating and proceeding with this work?

General Robertson. Sir, our eight hydroelectric projects on the Lower Columbia and Snake Rivers have been identified as a major contributing factor in causing mortality to downstream-migrating juvenile salmon and steelhead. In 1986, 48 million juvenile salmon and steelhead were produced in the Columbia-Snake River system. By 1993, this figure is expected to be 95 million. This mortality impacts a commercial and recreational fishery valued at an estimated $105 million annually.

Senator Hatfield. What role do you think transport of juvenile fish by truck and barge should have in the long term solution to this problem?

General Robertson. Sir, marked fish returns over a number of years have clearly demonstrated that juvenile fish transportation is a significant factor in the record runs of steelhead and improving runs of fall chinook salmon. Although unknown factors have depressed overall returns of spring chinook salmon, marked fish studies indicate that this species is also being benefited by transportation. So, it appears that transport is proving effective and should continue in the long term.

Senator Hatfield. What steps are you taking to assure transportation facilities are available as the Snake River hatcheries begin to increase the number of juveniles at the dams?

General Robertson. Sir, we are designing two new barges which will greatly increase hauling capacity and enable us to haul most of the juvenile fish that we expect to be available in the future. We are also designing new fish facilities at Little Goose and studying feasibility for similar facilities at McNary Dam.

Senator Hatfield. What is your capability in FY 1988 for fish bypass measures?

General Robertson. Sir, subject to the usual qualifications, we have FY 1988 operation and maintenance funding capability to begin acquisition of two fish barges for $2,072,000 in connection with Lower Granite project. We also have the O&M capability to initiate construction of new fish handling and loading facilities at Little Goose project for $6,720,000.

Senator Hatfield. For FY 1987, Congress specified that additional funds be used at Little Goose and McNary projects for juvenile fish facilities. How is this work progressing?

General Robertson. Si~, this work contained three elements. The Little Goose holding facility design is proceeding as scheduled this year. The Little Goose test of double length screen is being held in abeyance. Instead we are developing the concept of extended length screens with a test at Lower Granite and prototype testing at The Dalles. The fish handling facility feasibility study at McNary is on schedule.

Senator Hatfield. For FY 1987, Congress also urged that additional funds be used at Ice Harbor and Lower Monumental projects to expedite completion of bypass facilities. How is this work progressing?

General Robertson. Sir, at Ice Harbor we are using available funds for feasibility studies, prototype screen testing, fish guidance efficiency tests and spill effectiveness monitoring. This work is on schedule. At Lower Monumental, we completed prototype screen tests in FY 1986. In FY 1987 we are completing feasibility studies addressing bypass and holding and loading facilities. We also will conduct spill effectiveness monitoring at the Lower Monumental project.

Senator JOHNSTON. Senator Domenici?

Senator DOMENICI. Mr. Chairman, I have questions for the next panel. I am here a bit early.

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ADDITIONAL QUESTIONS SUBMITTED FOR THE RECORD

Senator JOHNSTON. General, Senators Stevens and McClure have some questions which we would like you to answer for the record.

General ROBERTSON. Yes, sir.

[The questions and answers follow:]

## QUESTIONS SUBMITTED BY SENATOR STEVENS

### HOMER SPIT, ALASKA, EROSION

Question. For fiscal year 1987, $297,000 was appropriated for investigation of long term solutions to erosion of the Homer Spit in Homer, Alaska. In addition, The Corps of Engineers was directed to use $600,000 out of funds appropriated for Section 103 small beach erosion control projects to respond to existing erosion damage to the Spit. What is the status of the investigation and what work has been done or is planned to carry out the small beach erosion control project?

Answer. Sir, the investigation is continuing on schedule and will be completed in March, 1988. With fiscal year 1988 funds we will initiate preconstruction engineering and design. Until the investigations have reached a point to make a decision on the basic project, we are withholding work on the Section 103 small beach erosion project.

### NEWLY AUTHORIZED PROJECTS IN ALASKA

Question. The Water Resources Development Act of 1986 authorized several projects in Alaska, three of which are considered by the residents of the affected communities and by the State to be of the highest priority. These are harbors for the cities of Saint Paul and Kodiak and an erosion control project for Bethel. I have several questions concerning these three projects:

Question. How long will preconstruction engineering and design take for each project?

Answer. We initiated preconstruction engineering and design for St. Paul Harbor in December 1986 and expect to complete it by April 1990 for a total of 3-1/2 years. We currently anticipate it would require 2 years to conduct design for Kodiak. We will complete the General Design Memorandum for Bethel by March 1987 and plans and specifica-tions by April 1988.

Question. If preconstruction work were begun in fiscal year 1988, when would each project be ready for the start of construction?

Answer. For St. Paul, preconstruction work is scheduled to be completed by April of 1990, when we would be ready to start construction. If we could initiate preconstruction on Kodiak in Fy 1988 we would be able to start construction in FY 1990. With preconstruction design for Bethel scheduled for completion in April 1988, we would then be ready to start construction.

Question. Are funds available in fiscal year 1987 to begin preconstruction work on any of these projects?

Answer. Yes, sir. We have funds currently available for preconstruction engineering and design for the St. Paul and Bethel projects which are underway.

Question. Once construction begins, how many years would be required to complete construction of each project, assuming appropriations are made available for each construction segment?

Answer. We anticipate it will require 2 years to construct each of these projects.

Question. What is the estimated cost of construction of each project and what is the federal estimated share of these costs?

Answer. The total estimated construction costs including the Federal and Non-Federal share for each of these projects is: St. Paul Harbor - $25.6 million; Kodiak Harbor - $15.4 million and Bethel Bank Stabilization-$19.2 million. The estimated ultimate federal cost for each project based on cost sharing as required by PL 99-662 is: St. Paul - $13.3 million; Kodiak Harbor - $12.3 million; and Bethel-$14.4 million.

## QUESTIONS SUBMITTED BY SENATOR MCCLURE

### CITY OF OROFINO WATER SUPPLY

Question. In the spring of 1986, the City of Orofino, Idaho talked to the Corps of Engineers, Walla Walla District, about connecting to a line the Corps proposes to build to a fish hatchery. The City would pay the incremental costs of piping water in a bigger pipe to Orofino. However, the Corps determined it should charge for the use of the water from the reservoir, at a cost equal to the highest benefit or revenue foregone -- avoided costs that could run as high as $60,000 a year for the City. I protested this method of charging, and asked the Corps to charge on the basis of benefits derived rather than avoided costs. The issue was taken under advisement. Has a decision been made regarding this matter? If so, what is that decision? If not, please explain the reason for the delay.

Answer. Sir, a decision on this issue has not been made pending further evaluation of alternative sources of water supply for the hatchery. The information to make that decision has been developed and is under review in higher authority.

### CLEARWATER HATCHERY

Question. Construction on the Clearwater Hatchery was expected to begin in the fall of 1987. What is the status of this project?

Answer. The start of construction on the Clearwater Hatchery has been delayed pending a decision on providing water to the hatchery.

Question. Why has the Corps not requested the $3 million funding for the hatchery in its FY 1988 budget?

Answer. Funds are not being requested for construction of the hatchery until the water supply source has been determined.

### CONCLUSION

Senator JOHNSTON. General Robertson, thank you very much. We appreciate your being before the committee and look forward for many years to your coming back.

General ROBERTSON. Thank you, Mr. Chairman.

## SOUTHWESTERN DIVISION

## STATEMENT OF MAJ. GEN. JEROME B. HILMES, DIVISION ENGINEER

**ACCOMPANIED BY:**

**CHARLES P. RINGENBERG JR., P.E., CHIEF, PROGRAMS MANAGEMENT OFFICE**
**GEORGE T. CARLSON, PROGRAMS MANAGEMENT OFFICE**
**WILLIAM P. JOHNSON JR., P.E., PROGRAMS MANAGEMENT OFFICE**
**BARRY G. ROUGHT, P.E., CHIEF, PLANNING DIVISION**

### INTRODUCTION OF WITNESSES

Senator JOHNSTON. Next, we want to welcome from the Southwestern Division Maj. Gen. Jerome B. Hilmes, Division Engineer.

General Hilmes, you might introduce those who accompany you and then proceed as you wish.

General HILMES. Thank you, Mr. Chairman.

Mr. Chairman and distinguished members of the committee, I am delighted to be here today to testify before this committee for the first time. We represent the Southwestern Division, the pacesetter division.

I have with me today, on my right, Charlie Ringenberg, my Chief of Programs, and Bill Johnson of the Programs Office; on the left, George Carlson of the Programs Office, and Barry Rought, my Chief Planner of the Division.

With your permission, sir, I will submit my status report for the record and briefly summarize that report, using a few slides.

The Division embraces all or parts of eight states, an area that has 16 percent of the land and 10 percent of the population of the United States. We have five engineer districts, with offices located in Fort Worth and Galveston, Tex.; Little Rock, Ark.; Tulsa, Okla.; and Albuquerque, N. Mex..

### FISCAL YEAR 1988 PROGRAM

The fiscal year 1988 budget request is for $350.8 million: 3 percent for general investigations, 40 percent for construction, general, and 57 percent for operation and maintenance.

### GENERAL INVESTIGATIONS

The general investigations program is $10.1 million, of which 57 percent will be for surveys and 43 percent for preconstruction engineering and design activities, or PED, which is a new term. For survey studies, $5.8 million is requested for 15 studies located throughout the Division area: two in Arkansas, one in Colorado, two in Kansas, three in New Mexico, three in Oklahoma, and four in Texas.

Let me draw your attention to three of these. The North Canadian

River above Lake Overholser study is located in central Oklahoma near Oklahoma City. It is a proposed new study start for which $210,000 is requested to initiate and complete the reconnaissance phase studies.

The study report for the Arkansas River and tributaries, south central and southeast Oklahoma comprehensive study, is scheduled for completion in September 1988, as is the Red River basin comprehensive study. The white dots on these slides indicate prospective project sites. An interim report on a multipurpose dam at Tuskahoma is scheduled for completion in June 1988.

### PRECONSTRUCTION ENGINEERING AND DESIGN [PED]

Moving now to PED activities, preconstruction engineering and design, $4.3 million is requested for eight projects located as follows: one in Arkansas, one in Kansas, two in New Mexico, and four in Texas. I would like to briefly discuss three of these.

### DOUGLASS LAKE, KANS.

The sum of $500,000 is requested for the Douglass Lake, Kans., project to initiate the general design memorandum. The plan here is to build an earthen dam to control floods in the Walnut River basin. PED is scheduled to be completed in June 1991.

### MIDDLE RIO GRANDE FLOOD PROTECTION, BERNALILLO TO BELEN, N. MEX.

For the middle Rio Grande, Bernalillo to Belen flood protection project, $400,000 is requested. The plan here is to raise and rehabilitate 52 miles of levees to provide protection to about 29,000 valley residents. Fiscal year 1988 funds will continue the detailed engineering effort which is scheduled to be complete in September 1989.

### TEXAS CITY CHANNEL, TEX.

The Texas City Channel project is located in the Galveston Bay area. This plan will deepen the channel to 50 feet. A total of $500,000 is requested to continue PED activities, to be complete in March 1989.

### CONSTRUCTION, GENERAL

Our fiscal year 1988 request for construction, general is $139.8 million: 4 percent for new starts, 94 percent for continuing projects, and 2 percent for dam safety assurance. Our request for construction, general is up from last year, and it can be expected to remain at or near this level in future years because of the passage of the 1986 Water Resources Development Act.

Included in this request is $5.8 million to start construction of four projects: Three in New Mexico—Alamogordo, Puerco River at Gallup and Truth or Consequences—and the Mingo Creek project at Tulsa, Okla. All of these will be constructed in accordance with the cost-sharing concepts outlined in the Water Resources Development Act of 1986. I will briefly describe all four.

### ALAMOGORDO, N. MEX.

Alamogordo, N. Mex.—the $2 million requested will allow us to start work on a system of channels and levees to protect the city from rainfall runoff from the mountains to the east.

### PUERCO RIVER AT GALLUP, N. MEX.

Puerco River at Gallup, N. Mex.—$760,000 is requested. A contract award for channels and levees to provide 100-year protection from flooding is scheduled for June 1988.

### TRUTH OR CONSEQUENCES, N. MEX.

Truth or Consequences, N. Mex.—this project will provide flood protection by means of a dam on the Cuchillo Negro Creek. The sum of $700,000 will permit a contract award for the dam access road in May 1988.

### MINGO CREEK AT TULSA, OKLA.

No. 4 is the Mingo Creek project at Tulsa, Okla. Channel improvements to protect the eastern part of the city are scheduled for award in May 1988.

A total of $130.8 million will be used to continue construction on 20 other projects, consisting of 1 in Arkansas, 1 in Arkansas and Oklahoma, 1 in Colorado, 2 in Kansas, 1 in New Mexico, 1 in Oklahoma, and 13 in Texas. I would like to highlight some of these.

### FOURCHE BAYOU BASIN, LITTLE ROCK, ARK.

The Fourche Bayou project at Little Rock, Ark., will continue with the $2.3 million requested. The initial contract for construction of channel improvements is scheduled for award in September 1987.

### FOUNTAIN CREEK, PUEBLO, COLO.

The Fountain Creek project at Pueblo, Colo., is included for $2.5 million. An initial contract will be awarded in August 1987.

### GREAT BEND, KANS.

The Great Bend, Kans., project has $1.6 million requested. This will permit completion of the initial contract for the system of channels and levees which will protect the city.

### LAKE WICHITA, HOLLIDAY CREEK AT WICHITA FALLS, TEX.

The Lake Wichita, Holliday Creek project is located in Wichita Falls, Tex. A total of $1.5 million will permit continuation of the initial channel contract, scheduled for award in September of this year.

## BOGGY CREEK, AUSTIN, TEX.

The Boggy Creek project, Austin, Tex., is scheduled for a construction start in April of this year. The requested $8.2 million will provide for continuation of channel improvements.

## CLEAR CREEK, TEX.

The Clear Creek project is located south of Houston. The $4.8 million requested will be used to initiate the outlet structure and channel rectification work.

## FREEPORT HARBOR, TEX.

For the Freeport Harbor, Tex., project, $11.4 million is requested. The first construction contract, for the relocation of the north jetty, is scheduled for award in March of this year.

## CORPUS CHRISTI SHIP CHANNEL, TEXAS

At the Corpus Christi, Tex., project, we will continue constructing retaining levees of the Suntide disposal area with the $6.2 million requested. This project is 64 percent complete.

## ARCADIA LAKE, OKLA.

The Arcadia project is located near Oklahoma City. It is 90 percent complete. Funds in the amount of $4.6 million will provide for the continuation of recreation facility contracts.

## RAY ROBERTS LAKE, TEX.

The Ray Roberts Dam, located north of the Dallas, Tex., area, is essentially on schedule and 68-percent complete. Impoundment is scheduled for this summer. A total of $25 million will be used primarily to continue construction of the recreation facilities and for relocations.

## JOE POOL LAKE, TEX.

At Joe Pool Lake, also in the Dallas metroplex area, the dam has been completed. Recreation facilities remain. A total of $9 million will be used to continue their construction.

## OPERATION AND MAINTENANCE

Turning now to operation and maintenance, general, $200.8 million is requested, of which 22 percent will be used on channels and harbors along the gulf coast, 10 percent on locks and dams, 36 percent on flood control activities, 30 percent for multiple-purpose projects, and 2 percent for protection of navigation and regulatory activities.

The request for dredging and maintaining 10 projects along the gulf coast is $44.5 million. This will provide for continued maintenance of projects like the Houston ship channel.

### McCLELLAN-KERR, ARKANSAS RIVER AND NAVIGATION SYSTEM, ARKANSAS AND OKLAHOMA

The fiscal year 1988 request includes $21 million for the continued operation and maintenance of 13 locks and dams on the McClellan-Kerr navigation system. This system, as you know, extends from the Mississippi to the head of navigation near Tulsa.

An appropriation of $71.2 million is requested for the continued effective operation and maintenance of 67 flood control projects, such as the Millwood, Ark., project and 7 other flood control activities.

### GENERAL REGULATORY ACTIVITIES

Funds in the amount of $4.6 million will be used primarily for general regulatory activities connected with the wetlands throughout the division area.

### RECREATION

Last year, lakes in the Southwestern Division attracted 139.7 million visitors. This is more than one-fourth of all visitors to the Corps' recreation areas nationwide. This recreation use is high because we have more large lakes than most divisions and our recreation season is longer.

### MULTIPLE-PURPOSE POWER PROJECTS

A total of $59.3 million is requested for 18 multiple-purpose power projects in the Southwestern Division. In addition to power, these projects provide one or more other benefits, including flood control, recreation, water supply, and navigation.

### FLOOD DAMAGES PREVENTED

Many of these projects have already prevented flood damages far in excess of their initial cost without regard to the other water-related benefits they generate each year. For instance, Clearwater Lake in Missouri has prevented $74.8 million in flood damages alone, which is 7.2 times its initial cost of $10.4 million.

### 1986 FLOODING

They also save lives, as demonstrated again in Oklahoma last fall. Record rains of up to 22 inches over 5 to 6 days drenched parts of Oklahoma and Kansas and produced the flood of record in many areas. The large volume of water caused considerable damage and caused flood storage capacities to be exceeded at five Oklahoma projects: Kaw, Keystone, Hulah, Copan, and Oologah. Damages were high, but the flooding was considerably less than what would have occurred without these projects.

### W.D. MAYO LOCK AND DAM, OKLA.

This flooding, combined with runoff from rains in areas uncontrolled by Corps dams or structures, caused flooding along the Arkansas River and its tributaries. The W.D. Mayo lock and dam near Fort Smith, Ark., was completely under water for about 3 weeks.

### DAMAGES PREVENTED—OCTOBER 1986 FLOOD

In summary, our projects during the October flood prevented about $891 million in damages.

### SUMMARY

As was evident last fall and in other flood events, the Southwestern Division has many water resource problems and needs throughout our eight-state area. And for fiscal year 1988, this request of $350.8 million, together with the local sponsor cash contributions of $20.1 million, will help solve these remaining problems and meet the water resource needs of our area.

### PREPARED STATEMENT

Mr. Chairman, this concludes my status report for the Southwestern Division. I will be happy to address any questions that you or members of the committee may have.

[The statement follows:]

## STATEMENT OF MAJ. GEN. JEROME B. HILMES

The Southwestern Division Area embraces all or parts of eight states, which is an area that contains about 16 percent of the land and 10 percent of the population of the United States. The Division's Civil Works mission centers on three River Basins: Texas Gulf, Arkansas White-Red and Rio Grande. The terrain varies from the eastern slopes of the Rocky Mountains in Colorado; to the arid region of New Mexico; to the plush green areas of Arkansas; to the tidal area of southeast Texas. The Division is headquartered in Dallas, Texas and includes five engineer districts, with headquarters located in Fort Worth and Galveston, Texas; Little Rock, Arkansas; Tulsa, Oklahoma; and Albuquerque, New Mexico.

## FISCAL YEAR 1988 PROGRAM

The Fiscal Year 1988 program for studies and projects in this area is $350,829,000. About three percent of this amount will be used for General Investigations; about 40 percent will be used for Construction; and about 57 percent will be used for Operation and Maintenance activities at completed projects. The requested amount for Fiscal Year 1988 compares to the $297,034,000 in Federal funds that have been or will be allocated to the Southwestern Division for the current year.

## GENERAL INVESTIGATIONS

The Fiscal Year 1988 Budget request for the General Investigations Appropriations is $10,161,000 of which 57% is allocated to Surveys and 43% to Preconstruction Engineering and Design activities. These Federal funds, together with scheduled cash contributions of $2,445,000 from local sponsors, will provide for continued planning on high priority studies and preconstruction engineering and design activities on high priority projects in the Southwestern Division area. This program of $12,606,000 for Fiscal Year 1988 compares with the $12,979,000, including a local interest contribution of $705,000, which is scheduled for use in Fiscal Year 1987. The change reflects the completion of three studies and preconstruction engineering and design on two projects in Fiscal Year 1987 and the completion of two studies in Fiscal Year 1988.

## SURVEY STUDIES

The Fiscal Year 1988 request of $5,841,000 in Federal funds for survey studies, together with local sponsor cash contributions of $2,445,000 on nine studies, for a total program of $8,286,000, will provide for the study effort on 15 separate survey investigations located on major river basins throughout the Division area. These studies are located as follows: two in Arkansas; one in Colorado; two in Kansas; three in New Mexico; three in Oklahoma; and four in Texas, as shown in following table:

## FISCAL YEAR 1988 SURVEY PROGRAM

| STUDY | FY 1988 FEDERAL REQUEST | FY 1988 LOCAL SPONSOR CONTRIBUTION |
|---|---|---|
| ARKANSAS | | |
| Arkansas River Basin, AR & OK | $700,000 | $260,000 |
| White River Basin, AR & MO | 400,000 | 400,000 |
| COLORADO | | |
| Fountain Creek and Tributaries North of Pueblo | 140,000 | 140,000 |
| KANSAS | | |
| Arkansas River and Tributaries, Great Bend, Kansas to Tulsa, Oklahoma | 500,000 | 0 |
| Grand (Neosho) River, KS & OK | 300,000 | 300,000 |
| NEW MEXICO | | |
| Carlsbad, Pecos River and Tributaries | 150,000 | 150,000 |
| Rio Grande and Tributaries, NM & CO | 525,000 | 0 |
| Roswell, Pecos River and Tributaries | 350,000 | 350,000 |
| OKLAHOMA | | |
| Arkansas River and Tributaries, South Central and Southeast Areas | 419,000 | 0 |
| North Canadian River above Lake Overholser | 210,000 | 0 |
| Red River Basin, OK, AR, TX & LA | 660,000 | 0 |
| TEXAS | | |
| Brazos River and Tributaries | 642,000 | 0 |
| Cameron County | 600,000 | 600,000 |
| Hillebrandt Bayou and Tributaries | 170,000 | 170,000 |
| Little Fossil Creek, Vicinity of Haltom City | 75,000 | 75,000 |
| TOTALS | $5,841,000 | $2,445,000 |

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The requested funds, together with non-Federal contributions, will provide for a total of $8,286,000 for: the initiation and completion of the Reconnaissance Phase, at full Federal expense, of one study; the completion of two studies; the continuation of three studies at full Federal expense; and the continuation of nine feasibility studies in partnership with local sponsors. This total program of $8,286,000 compares with a total program of $7,996,000 in Fiscal Year 1987 (Federal funds of $7,291,000 plus local sponsor contributions of $705,000).

## NEW STUDY
## NORTH CANADIAN RIVER ABOVE LAKE OVERHOLSER, OKLAHOMA

The Fiscal Year 1988 request includes $210,000 to initiate and complete the reconnaissance phase studies on the North Canadian River above Lake Overholser, Oklahoma flood damage prevention study. The study will address flood control problems along the North Canadian River between Lake Overholser and Canton Lake, Oklahoma. Widespread damages have been reported throughout the study area, including the cities of Calumet, El Reno, Banner and Yukon, Oklahoma. The reconnaissance phase studies are scheduled for completion in September 1988.

## STUDY COMPLETIONS

The Fiscal Year 1988 request includes $1,079,000 for the completion of two comprehensive studies at full Federal expense. These studies and their scheduled completion dates are as follows: Arkansas River and Tributaries, South Central and Southeast Areas of Oklahoma, Comprehensive Study, September 1988; and the Red River Basin, Arkansas, Texas, Louisiana and Oklahoma, Comprehensive Study, September 1988. An Interim Report for Tuskahoma, Oklahoma, being prepared under the Red River Basin Comprehensive, is also scheduled for completion in June 1988.

## CONTINUING FEDERALLY FUNDED STUDIES

Included in the request for Fiscal Year 1988 is $2,107,000 for the continuation of study effort, at full Federal expense, on three studies and the navigation portion of one study (Arkansas River Basin, Arkansas and Oklahoma) that were funded last year. The three studies are: Arkansas River and Tributaries, Great Bend, Kansas to Tulsa, Oklahoma; Rio Grand and Tributaries, New Mexico and Colorado; and Brazos River and Tributaries, Texas.

## CONTINUATION OF PARTNERSHIP STUDIES

The Fiscal Year 1988 request includes $2,445,000 for continuation of feasibility studies on nine surveys; White River Basin, Arkansas and Missouri; Fountain Creek and Tributaries North of Pueblo, Colorado; Grand (Neosho) River, Kansas and Oklahoma; Carlsbad, Pecos River and Tributaries, New Mexico; Roswell, Pecos River and Tributaries, New Mexico; Cameron County, Texas; Hillebrandt Bayou and Tributaries, Texas; Little Fossil Creek, Vicinity of Haltom City, Texas; and the flood control portion of the feasibility phase on one survey (Arkansas River Basin, Arkansas and Oklahoma). These surveys are being pursued on a 50-50 cost sharing basis with local sponsors in accordance with Public Law 99-662, the Water Resources Development Act of 1986. The requested funds, together with local sponsor contributions of $2,445,000 will provide for a Fiscal Year 1988 program of $4,890,000 for these studies and will permit completion of the studies as follows: Arkansas River Basin in September 1989 (with a navigation interim report in Fiscal Year 1988); White River Basin in September 1989; Fountain Creek North of Pueblo in

August 1990; Carlsbad, Pecos River in January 1989; Roswell, Pecos River in August 1989; Cameron County in September 1990; Hillebrandt Bayou and Tributaries in September 1989; Little Fossil Creek, Vicinity of Haltom City in February 1990; and Grand (Neosho) River, Kansas and Oklahoma, in September 1993.

## FOUNTAIN CREEK AND TRIBUTARIES
## NORTH OF PUEBLO, COLORADO

This survey was authorized by a resolution from the House Committee on Public Works and Transportation adopted on September 23, 1976. A $200,000 initial work allowance was allocated in FY 1984 to initiate the reconnaissance phase of the study. Fiscal Year 1985 funds ($95,000) were used to complete the Reconnaissance Report in September 1985. To date, only one local sponsor, the city of Colorado Springs, has expressed the financial capability to cost share in the feasibility phase and negotiations are underway. The feasibility study cost sharing agreement with Colorado Springs should be concluded by April of this year and the feasibility phase subsequently initiated, using $40,000 in Fiscal Year 1987 Federal funds matched by local funds. The $140,000 requested for Fiscal Year 1988 funds would be used to continue the feasibility study.

Additional areas that may participate in feasibility studies, in accordance with Public Law 99-662, the Water Resources Development Act of 1986 include the city of Manitou Springs and the county of El Paso.

## CARLSBAD, PECOS RIVER AND TRIBUTARIES, NEW MEXICO
## ROSWELL, PECOS RIVER AND TRIBUTARIES, NEW MEXICO

Two studies, Carlsbad, Pecos River and Tributaries, New Mexico and Roswell, Pecos River and Tributaries, New Mexico were funded for initiation and completion of the reconnaissance phase at full Federal expense as a single study, Pecos River and Tributaries, New Mexico, in Fiscal Year 1985. Initial reconnaissance phase studies, however, revealed the single study should be divided into two separate studies because of the mutually exclusive nature of the flood problem at Carlsbad and at Roswell and the identification of two separate local interest sponsors for these areas.

Analysis necessary for the reconnaissance phase at Carlsbad were completed in October 1986. The reconnaissance phase is expected to be formally completed with conclusion of a feasibility study cost sharing agreement in accordance with Public Law 99-662, the Water Resources Development Act of 1986, in April 1987. Subsequently the feasibility phase will be initiated using Fiscal Year 1987 funds and continued using the requested Fiscal Year 1988 funds. The feasibility phase is scheduled for completion in January 1989.

The Roswell reconnaissance phase will be completed in June 1987 and the feasibility study will be initiated using Fiscal Year 1987 funds. The funds requested for Fiscal Year 1988, together with a local sponsor contributions, would be used to continue the feasibility phase which is scheduled for completion in August 1989.

# PRECONSTRUCTION ENGINEERING AND DESIGN

This is a new category and reflects the consolidation of the Continuation of Planning and Engineering category and the Advance Engineering and Design category of previous years. The request for Fiscal Year 1988 includes $4,320,000 for the continuation of Preconstruction Engineering and Design effort on eight projects. The cost of this engineering and design effort will be included in the total cost of the project and subsequently cost shared with local sponsors in accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986. These projects are located as follows: one project in Arkansas; one project in Kansas; two projects in New Mexico; and four projects in Texas. The projects and amounts requested for Fiscal Year 1988 are listed in the following table:

FISCAL YEAR 1988 PRECONSTRUCTION ENGINEERING AND DESIGN PROGRAM (PED)

| PROJECT | FY 1988 REQUESTED AMOUNT |
|---|---|
| ARKANSAS | |
| North Little Rock, (Dark Hollow) (Not Authorized) | $300,000 |
| KANSAS | |
| Douglass Lake | 500,000 |
| NEW MEXICO | |
| Middle Rio Grande Flood Protection, Bernalillo to Belen | 400,000 |
| Rio Grande Floodway, San Acacia to Bosque del Apache Unit | 390,000 |
| TEXAS | |
| Brazos Island Harbor - Brownsville Channel (42-Foot Project) | 330,000 |
| Sims Bayou (Houston) | 850,000 |
| Texas City Channel (50-Foot Project) | 500,000 |
| Upper White Oak Bayou and Tributaries, Vicinity of Houston | 1,050,000 |
| TOTAL | $4,320,000 |

The funds requested compares with $4,983,000 allocated for this cateory for Fiscal Year 1987. This change reflects completion of Preconstruction Engineering and Design on three projects (Alamogordo, New Mexico; Rio Grande Floodway, Truth or Consequences Unit, New Mexico; and Mingo Creek, Tulsa Oklahoma). All three of these projects are included in the Fiscal Year 1988 construction program as recommended new construction starts.

# NORTH LITTLE ROCK (Dark Hollow), ARKANSAS

The $300,000 programed for Fiscal Year 1988 will be used to continue Preconstruction Engineering and Design studies for a proposed plan to reduce flood damages in the Dark Hollow area. The proposed plan includes the construction of a new channel and outlet to reduce the flood heights in the area. A draft Reformulation Report was completed in August 1986 and the General Design Memorandum is scheduled for completion in September 1988. The project is not yet authorized for construction; however, the first cost of the proposed plan is currently estimated at $6,900,000. In accordance with the cost sharing and financing concepts reflected in the Water Resource Development Act of 1986, the costs would be shared $4,000,000 Federal and $2,900,000 non-Federal. The benefit-cost ratio is 2.5 to 1 at 8-7/8 percent interest rate.

## DOUGLASS LAKE, KANSAS

Funds in the amount of $500,000 are programed for Fiscal Year 1988 to continue engineering efforts on the Douglass Lake, Kansas project. A Reconnaissance Reevaluation Report was completed in September 1984 which determined Douglass to be economically feasible. A General Reevaluation Report will be completed in September 1987 and the General Design Memorandum will be initiated with funds requested for Fiscal Year 1988.

The project was authorized for construction by the Flood Control Act of 1965. The proposed plan of improvement consists of a rolled-earth embankment and a controlled spillway. The embankment would be 11,640 feet long, including the spillway, with a maximum height of 89 feet above the streambed. The project has an estimated first cost of $84,500,000 with a benefit-cost ratio of 1.3 to 1 at 8-7/8 percent interest rate. In accordance with the cost sharing and financing concepts reflected in Public Law 99-662, the Water Resources Development Act of 1986, the Federal share of the first cost of the project is estimated at $33,800,000 and the non-Federal share at $50,700,000. The Preconstruction Engineering and Design effort is scheduled for completion in June 1991.

## MIDDLE RIO GRANDE, FLOOD PROTECTION
## BERNALILLO TO BELEN, NEW MEXICO

The Preconstrucion Engineering and Design effort, initiated in Fiscal Year 1984 on the Bernalillo to Belen project, will be continued with the $400,000 requested for Fiscal Year 1988. This project, which was authorized by Public Law 99-662, the Water Resource Development Act of 1986 will provide protection from flooding to a large segment of the 110 square miles of the flood plain which adjoin the Rio Grande. The area to be protected has 29,000 residents and $725,000,000 in improvements. Should the flood of record of April 1942 occur again, damages in excess of $85,000,000 could be expected if the project were not in place. Studies to date indicate the plan of improvement would consist of raising and strengthening about 51.5 miles of levees at an estimated cost of $50,700,000 and would have a benefit-cost ratio of 1.3 to 1 at an interest rate of 8-7/8 percent. In accordance with the cost sharing and financing concepts of the Water Resources Development Act of 1986, the Federal portion of the project first cost is estimated at $37,800,000 and the non-Federal portion at $12,900,000. The scheduled completion date for Preconstruction Engineering and Design is September 1989.

# RIO GRANDE FLOODWAY, SAN ACACIA TO BOSQUE DEL APACHE UNIT, NEW MEXICO

Funds in the amount of $390,000 are requested for Fiscal Year 1988 to continue Preconstruction Engineering and Design work on the San Acacia to Bosque del Apache project. The project provides for the complete removal and replacement of the existing spoil bank levee established by the U.S. Bureau of Reclamation to separate the Rio Grande low-flow conveyance channel, which is the primary damageable property in the project area, from the cleared floodway. The project would extend from the upper end of the low-flow conveyance channel, at the San Acacia diversion works, to the lower end of the low-flow conveyance channel at the head of Elephant Butte Reservoir, a distance of about 58 miles.

The project, authorized for construction by the 1948 and 1950 Flood Control Acts, has an estimated first cost of $32,300,000 and a benefit-cost ratio of 3.8 to 1 at 8-7/8 percent interest rate. In accordance with the cost sharing and financing concepts reflected in Public Law 99-662, the Water Resources Development Act of 1986, the Federal share of the first cost is estimated at $24,200,000 and the non-Federal share at $8,100,000. Preconstruction Engineering and Design is scheduled to be completed in July 1991.

# BRAZOS ISLAND HARBOR BROWNSVILLE CHANNEL (42-FOOT PROJECT), TEXAS

The Fiscal Year 1988 request of $330,000 will permit continuation of Preconstruction Engineering and Design activities on the Brazos Island Harbor, Texas, Brownsville Channel (42-foot project) which is located near Brownsville, Texas. Initial preconstruction engineering funds in the amount of $300,000 were provided in Fiscal Year 1987. Subsequent to that appropriation, the project was authorized for construction by Public Law 99-662, the Water Resources Development Act of 1986. The proposed plan of improvement provides for modifying the entrance channel from a depth of 38 feet to 44 feet at a width of 400 feet; the interior channel from 36 feet deep by 200 feet wide to 42 feet deep by 300 feet wide; and enlarging the turning basin area.

The total cost of the proposed plan is $28,550,000 and the benefit-cost ratio is 1.6 to 1 at a 8-7/8 percent interest rate. In accordance with the cost sharing concepts and financing concepts reflected in the Water Resources Development Act of 1986, the Federal share of the first cost is estimated at $20,200,000 and the non-Federal share at $8,350,000. Completion of Preconstruction Engineering and Design for the Brazos Island Harbor project is scheduled for September 1990.

# SIMS BAYOU (HOUSTON), TEXAS

The $850,000 requested for Fiscal Year 1988 will be used to continue Preconstruction Engineering and Design activities for a proposed plan of improvement on Sims Bayou in Houston, Texas. The project was authorized for construction by Public Law 99-662, the Water Resources Development Act of 1986. The plan consists of improvements along 19.3 miles of Sims Bayou to provide flood protection and recreational opportunities to the area. The proposed plan of improvement has an estimated cost of $126,300,000 and a benefit-to-cost ratio of 9.0 to 1 at 8-7/8 percent interest rate. In accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986, the Federal share of the project's first cost is estimated at $93,600,000 and the non-Federal share at $32,700,000. This Preconstruction Engineering and Design effort is scheduled for completion in September 1989.

## TEXAS CITY CHANNEL
## (50-FOOT PROJECT), TEXAS

The project was authorized for construction by Public Law 99-662, the Water Resources Development Act of 1986. The recommended plan provides for deepening the Texas City Turning Basin to 50 feet; enlarging the 6.7 mile-long Texas City Channel to 50 feet by 600 feet; deepening the existing 800-foot-wide Bolivar Roads Channel and Inner Bar Cannel to 50 feet; deepening the existing 800-foot-wide Outer Bar and Galveston Entrance Channels to 52 feet; extending the Galveston Entrance Channel at a 52-foot depth for 4.1 miles at a width of 800 feet and an additional 8.3 miles at a width of 600 feet; and the construction of an offshore emergency turning point. The plan also includes the establishment of 600 acres of wetland and development of water-oriented recreational facilities on a 90-acre enlargement of the Texas City Dike. The plan of improvement has an estimated cost of $179,500,000 and a benefit-cost ratio of 3.4 to 1 at 8-7/8 percent interest rate. In accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986, the Federal share of the first cost is estimated at $108,000,000 and the non-Federal share at $71,500,000.

Fiscal Year 1987 funds are being used to complete studies to reaffirm project feasibility, reassess the current economic and projected conditions, validate environmental impacts, and to assure that the project is in compliance with laws and regulations that have been implemented since the study was completed and to initiate design studies. The funds requested for Fiscal Year 1988 will be used to continue design studies and to complete the General Design Memorandum. The Preconstruction Engineering and Design effort is scheduled for completion in March 1989.

## UPPER WHITE OAK BAYOU AND TRIBUTARIES
## VICINITY OF HOUSTON, TEXAS

Public Law 99-662, the Water Resources Development Act of 1986 authorized the project on Upper White Oak Bayou and Tributaries near Houston, Texas for construction. The project provides for channel improvements in White Oak Bayou from Mile 10.7 to Mile 19.9, on Cole Creek from its mouth to Mile 4.9 and on Vogel Creek from its mouth to Mile 4.5. In addition, regulation of the residual 100 year flood plains along the streams and recreational development of project lands along White Oak Bayou, between Mile 14.6 and Mile 18.3 are proposed. The authorized plan of improvement has an estimated first cost of $90,600,000 and a benefit-cost ratio of 1.4 to 1 at an interest rate of 8-7/8 percent and a project life of 100 years. In accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986, the Federal share of the authorized project's first cost is estimated at $67,600,000 and the non-Federal share at $23,000,000. The funds requested for Fiscal Year

1988, in the amount of $1,050,000, will be used to continue Preconstruction Engineering and Design studies and to complete the General Design Memorandum. Preconstruction Engineering and Design is scheduled for completion in March 1989.

## CONSTRUCTION, GENERAL

The Fiscal Year 1988 request for Construction, General, in the amount of $139,811,000, would provide for construction activities on 26 projects, including one Dam Safety Assurance project, in the Southwestern Division. These funds, together with scheduled cash contributons of $17,739,000 from the local sponsors, for a total of $157,550,000, will provide for a construction program that includes: the initiation of four projects; the continuation of construction on 19 projects; the completion of two projects (Albuquerque North Diversion Channel, New Mexico and Vince and Little Vince Bayous, Texas); the continued construction of one project entirely with non-federal funds (Town Bluff Hydropower, Texas); and the continuation of one Dam Safety Assurance project (Buffalo Bayou and Tributaries, Texas, Addicks and Barker Dams).

The proposed program of $157,550,000 for the Southwestern Division in Fiscal Year 1988 compares with the $91,760,000 in allocated Federal funds and local sponsors cash contributions of $11,603,000 for a total program of $103,373,000 in Fiscal Year 1987. This change in funding level reflects increased efforts on the three projects added by the 1985 Supplemental Appropriations Act (Freeport Harbor, Clear Creek and Boggy Creek, Austin); the four budgeted (Fourche Bayou Basin, Great Bend, Halstead and Lake Wichita, Holliday Creek at Wichita Falls) and two Congressional adds (Fountain Creek, Pueblo and Albuquerque North Diversion Channel) in the 1987 Continuing Resolution Act; and the proposed four new construction starts in Fiscal Year 1988.

Funding requirements for the Construction, General Appropriation in the Southwestern Division can be expected to remain at or near this level in future years because of the passage of the Water Resource Development Act of 1986.

## CONSTRUCTION, GENERAL
## RECOMMENDED NEW STARTS - FISCAL YEAR 1988

The request includes $5,860,000 for the initiation of construction on four local protection projects; Alamogordo, New Mexico; Puerco River and Tributaries, Gallup, New Mexico; Rio Grande Floodway, Truth or Consequences Unit, New Mexico; and Mingo Creek, Tulsa, Oklahoma. These projects will be constructed in partnership with local interests in accordance with the cost sharing and financing concepts reflected in the Water Resource Development Act of 1986. Local interests are scheduled to expend $18,089,000 during Fiscal Year 1988 in providing the necessary Lands, Easements, Rights-of-Way and Relocations. These projects and the requested amounts of Federal funding for Fiscal Year 1988, together with the estimated non-Federal outlays for Fiscal Year 1988, are listed in the following table:

## FISCAL YEAR 1988 NEW CONSTRUCTION START PROGRAM

| PROJECT | FY 1988 FEDERAL FUNDS REQUEST | TOTAL FY 1988 NON-FEDERAL COSTS 1/ |
|---|---|---|
| Alamogordo, New Mexico | $2,000,000 | $5,150,000 |
| Puerco River and Tributaries, Gallup, New Mexico | 760,000 | 374,000 |
| Rio Grande Floodway, Truth or Consequences Unit, New Mexico | 700,000 | 1,565,000 |
| Mingo Creek, Tulsa, Oklahoma | 2,400,000 | 11,000,000 |
| TOTALS | $5,860,000 | $18,089,000 |

1/ Includes Lands, Easements, Rights-of-Way, and Relocations, as applicable.

## ALAMOGORDO, NEW MEXICO

The Alamogordo project is located in south-central New Mexico at the foot of the Sacramento Mountains on the eastern edge of the Tularosa Basin, which is a closed basin. The flood problem at Alamogordo is caused by flows originating in the canyons east of town flowing west through the city towards the basin floor west of Alamogordo. The project was authorized by the Flood Control Act of 1962. The recommended plan of improvement consists of about 5.6 miles of a diversion channel aligned east and north of the city limits of Alamogordo. The channel would divert flood flows northward to Dillard Draw then westward to an area of "Alkali Flats" where it will be dissipated by evaporation and percolation. The estimated first cost is $27,200,000 and the benefit-cost ratio is 4.6 to 1 at 8-7/8 percent interest rate. In accordance with the cost sharing and financing concepts reflected in Public Law 99-662, the Water Resources Development Act of 1986, the Federal share of the project's first cost is estimated at $20,400,000 and the non-Federal share at $6,800,000.

Fiscal Year 1987 funds are being used to complete Preconstruction Engineering and Design. The funds requested for Fiscal Year 1988 would be used to prepare plans and specifications and to initiate construction on the diversion channel in June 1988. The project is scheduled for completion in June 1991.

## PUERCO RIVER AND TRIBUTARIES, GALLUP, NEW MEXICO

The Puerco River, Gallup, New Mexico project was authorized by Public Law 99-662, the Water Resources Development Act of 1986. The Puerco River flows roughly east to west through the center of the city. The Gallup area has a long history of floods from the Puerco. The largest recorded flood occurred in 1972, causing $1.3 million in damage. The plan of improvement for this project includes the construction of levees, removal of a rock knoll, acquisition of flooding easements, flood plain management, and wildlife mitigation at an estimated total cost of $7,300,000 of which $1,800,000 is estimated to be non-Federal. The benefit-cost ratio is 1.3 to 1 at 8 7/8 percent interest rate.

The request for Fiscal Year 1988 of $760,000 will be used to initiate and complete plans and specifications and award the initial construction contract in June 1988. The project is scheduled for completion in March 1990.

## RIO GRANDE FLOODWAY, TRUTH OR CONSEQUENCES UNIT, NEW MEXICO

The Flood Control Acts of 1948 and 1950 authorized construction of levees along the Rio Grande through the town of Truth or Consequences; however, because of urban development, the original plan is no longer practical or economically feasible. Funds to initiate preconstruction planning were appropriated in Fiscal Year 1979. A Reevaluation Report, completed in Fiscal year 1986, determined that the optimal plan of improvement would be a roller-compacted concrete dam on Cuchillo Negro Creek. This dam project, authorized by Public Law 99-662, the Water Resources Development Act of 1986, would protect the area from the 100-year flood and have an estimated first cost of $16,000,000 with a benefit-cost ratio of 1.8 to 1 at 8-7/8 percent interest rate. In accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986, the Federal share of the project's first cost is estimated at $12,000,000 and the non-Federal share at $4,000,000.

Fiscal Year 1987 funds are being used to complete Preconstruction Engineering and Design. The requested $700,000 for Fiscal Year 1988 would be used to initiate construction of the project with award of the access road contract in May 1988. Project completion is scheduled for March 1991.

## MINGO CREEK, TULSA, OKLAHOMA

The Mingo Creek, Tulsa, Oklahoma project, was authorized by Public Law 99-662, the Water Resources Development Act of 1986. Mingo Creek flows through the eastern part of Tulsa, Oklahoma and, on the average, floods about once every two-to-three years. Since 1959, ten major floods have been recorded. The flood of record occurred in May 1984, devastating the area in the Mingo Creek flood plain with damages estimated at $124,000,000 along with five fatalities being attributed to this flood. The authorized project includes 23 detention ponds and 7.5 miles of channel improvements at selected spots on the tributaries and main stem of Mingo Creek. The project has an estimated construction first cost of $131,000,000 with a benefit-cost ratio of 2.4 to 1 at an interest rate of 8-7/8 percent. In accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986, the Federal share of the project's first cost is estimated at $80,900,000 and the non-Federal share at $50,100,000.

The funds requested for Fiscal Year 1988 will be used to initiate construction of channel improvements on Audubon Creek in May 1988 and on Mingo Creek at 36th Street North in June 1988. The project is scheduled for completion in September 1995.

## CONTINUING CONSTRUCTION

The Fiscal Year 1988 request includes $130,851,000 to continue 18 projects and to complete two projects that were funded in prior fiscal years. The corresponding non-Federal estimated outlays for Fiscal Year 1988 are $58,249,000 of which $17,739,000 are scheduled cash contributions. The total continuing construction program to be accomplished by the Southwestern Division in Fiscal Year 1988 is $148,590,000. These projects are located as follows: one in Arkansas; one in Arkansas and Oklahoma; one in Colorado; two in Kansas; one in New Mexico; one in Oklahoma; and thirteen in Texas. In addition to the 20 projects for which Federal funds are requested, one project, the Town Bluff Hydropower project in Texas, will continue utilizing funds provided by the local sponsor. The requested amount for Fiscal Year 1988 compares with the $85,018,000 allocated to these projects in the current year and reflects increased needs on several projects including Boggy Creek, Austin; Clear Creek; Cooper Lake and Channel; Freeport Harbor; San Antonio Channel Improvement; and Joe Pool Lake, Texas. These increased requirements were partially offset by declining requirements for the Ray Roberts Lake, Texas project as it nears completion. These projects and their Fiscal Year 1988 funding requirements are listed in the following table:

### FISCAL YEAR 1988 CONTINUING CONSTRUCTION PROGRAM

| PROJECT | FY 1988 FEDERAL FUNDS REQUESTS | FY 1988 NON-FEDERAL CASH CONTRIBUTIONS | TOTAL FY 1988 NON-FEDERAL COSTS 1/ |
|---|---|---|---|
| ARKANSAS | | | |
| Fourche Bayou Basin, Little Rock | $2,300,000 | $180,000 | $4,228,000 |
| ARKANSAS AND OKLAHOMA | | | |
| McClellan-Kerr Arkansas River Navigation System, Locks and Dams | 4,350,000 | 0 | 0 |
| COLORADO | | | |
| Fountain Creek, Pueblo | 2,500,000 | 50,000 | 50,000 |
| KANSAS | | | |
| Great Bend | 1,600,000 | 400,000 | 6,000,000 |
| Halstead | 500,000 | 200,000 | 807,000 |
| NEW MEXICO | | | |
| Albuquerque North Diversion Channel | 354,000 | 0 | 0 |
| OKLAHOMA | | | |
| Arcadia Lake | 4,600,000 | 0 | 0 |

TEXAS

| | | | |
|---|---|---|---|
| Boggy Creek, Austin | 8,200,000 | 800,000 | 800,000 |
| Clear Creek | 4,800,000 | 600,000 | 9,600,000 |
| Cooper Lake and Channels | 14,000,000 | 0 | 0 |
| Corpus Christi Ship Channel | 6,200,000 | 809,000 | 809,000 |
| El Paso | 1,500,000 | 0 | 6,465,000 |
| Freeport Harbor | 11,400,000 | 3,800,000 | 8,932,000 |
| Joe Pool Lake | 9,000,000 | 530,000 | 530,000 |
| Lake Wichita, Holliday Creek, at Wichita Falls | 1,500,000 | 300,000 | 3,600,000 |
| Mouth of Colorado River | 2,200,000 | 100,000 | 790,000 |
| Ray Roberts Lake | 25,000,000 | 0 | 0 |
| San Antonio Channel Improvement | 25,000,000 | 700,000 | 4,700,000 |
| Taylors Bayou | 3,700,000 | 1,270,000 | 2,938,000 |
| Town Bluff Hydropower | 0 | 8,000,000 | 8,000,000 |
| Vince and Little Vince Bayous | 2,147,000 | 0 | 0 |
| TOTALS | $130,851,000 | $17,739,000 | $58,249,000 |

1/ Includes Lands, Easements, Rights-of-Way, Relocations and Cash Contributions, as applicable.

## FOURCHE BAYOU BASIN
## LITTLE ROCK, ARKANSAS

The project was authorized by Public Law 99-662, the Water Resources Development Act of 1986. The National Economic Development plan for this project includes work along about 7.3 miles of Rock and Grassy Flat Creeks, and 4.8 miles of Fourche Creek. The estimated first cost of this plan is $22,100,000 (including an allowance for inflation). In accordance with the cost sharing and financing concepts of the Water Resources Development Act of 1986 the Federal share of the project's first cost is estimated at $11,050,000 and the non-Federal share at $11,050,000.

The $2,300,000 funds requested for Fiscal Year 1988, together with a cash contribution of $180,000 from the local sponsor, will be used to continue construction. In addition to the cash contribution, the local sponsor is scheduled to expend $4,048,000 for real estate activities, and relocations during Fiscal Year 1988. The initial contract is scheduled for award in September 1987 and overall project completion is scheduled for June 1991.

## FOUNTAIN CREEK, PUEBLO, COLORADO

The project on Fountain Creek at Pueblo, Colorado was authorized for construction by Public Law 99-662, the Water Resources Development Act of 1986. Preconstruction planning, completed in Fiscal Year 1985, identified a substantial need for flood protection from Fountain Creek. The area protected is over 90 percent developed and begins suffering flooding from a 14-year event. If the flood of record, which occurred in 1965, took place today it would result in over $20 million in damages, of which $15.3 million would be prevented by this project. The project comprises 11,500 feet of channel modification and 9,700 feet of levee which provides a 200-year level of protection at an estimated first cost of

$8,600,000. In accordance with the cost sharing and financing concepts of the Water Resource Development Act of 1986, the Federal share of the project's first cost is estimated at $6,270,000 and the non-Federal share at $2,330,000.

Funds for initiation of construction were received in Fiscal Year 1987. Preparation of plans and specifications is underway and award of the first construction contract is scheduled in August 1987. Project completion is scheduled for March 1990.

## GREAT BEND, KANSAS

The Great Bend, Kansas project, authorized by the Flood Control Act of 1965, is a system of levees and channels being designed to reduce the flood damages that occur frequently in the city. Major features of this local protection project consist of a total of 8.6 miles of leveed channel west of Great Bend to divert the Walnut and Little Walnut Creeks flood flows into the Arkansas River upstream of the City. From this confluence of the Walnut Creeks diversion with the Arkansas River, 6 miles of improved channel with levees downstream along the Arkansas River and 7.3 miles of a tieback levee upstream along the north bank of the Arkansas River are being designed. The total estimated cost of this plan is $41,300,000 (including an allowance for inflation during the construction period) of which about $21,000,000 would be Federal and $20,300,000 would be non-Federal costs, consistent with the cost sharing and financing concepts reflected in the Water Resource Development Act of 1986.

The first contract, using funds allocated for Fiscal Year 1987, is scheduled for award in July 1987. Funds requested for Fiscal Year 1988 in the amount of $1,600,000, together with a cash contribution of $400,000 from the local sponsor, will be used to continue levee construction and to initiate channel construction. During Fiscal Year 1988 the local sponsor will also expend about $5,600,000 to obtain necessary lands, easements, rights-of-way and to continue construction of required relocations. The project is scheduled for completion in March 1992.

## HALSTEAD, KANSAS

The Halstead, Kansas project, authorized by Public Law 99-662, the Water Resources Development Act of 1986, consists of about four miles of earthen levees and 3.6 miles of channel modifications along the Arkansas River. The project has an estimated cost of $7,400,000 (including an allowance for inflation) of which $5,600,000 would be Federal and $1,800,000 would be non-Federal costs. Average annual benefits are $1,278,000 and the remaining benefit-remaining cost ratio is 1.9 to 1 at 8-5/8 percent interest rate.

Funds provided in Fiscal Year 1987 are being used to continue engineering and design work; however, initiation of construction has been delayed to permit the local sponsor to obtain the necessary financing for their share of the project. The Fiscal Year 1988 request of $500,000, together with a cash contribution of $200,000 from the local sponsor, will be used to initiate construction in August 1988. In addition, the local sponsor is scheduled to expend about $607,000 in Fiscal Year 1988 for required lands, easements, rights-of-way and relocations associated with construction of this project. The project is scheduled for completion in June 1991.

## ARCADIA LAKE, OKLAHOMA

Construction of the Arcadia Lake project, which is located near Oklahoma City, is about 90 percent complete. Work on raising the Turner Turnpike continues to advance with completion of this relocation scheduled for this coming spring. All other county road relocations, major utility relocations, and reservoir clearing are complete. Closure of the dam was completed in October 1985 and deliberate impoundment of the lake was initiated in November 1986. The funds requested for Fiscal Year 1988 will be used to continue construction of recreation facilities and to complete all other major features of the project. The project is scheduled for completion in February 1990.

## BOGGY CREEK, AUSTIN, TEXAS

Construction of this project is scheduled to be initiated this Fiscal Year with the award of the Phase I contract in April 1987. The Phase I contract will consist of the improvement of 1.1 miles of grass-lined channel. The 1.7 miles of paved channel will be awarded in a Phase II contract which is currently scheduled for award in March 1988. The Corps is currently working with the city of Austin in exploring the possibility of using gabions in lieu of concrete for channel side slopes for the Phase II contract. The city of Austin is the local sponsor and a Local Cooperation Agreement was signed by the city on 27 June 1986. Project completion is scheduled for September 1989.

## CLEAR CREEK, TEXAS

The project is located midway between Galveston and southeast Houston, Texas and includes about 15 miles of channel improvement above the existing Clear Lake, together with a gated outlet structure and channel between Clear Lake and Galveston Bay. The local sponsors, Galveston and Harris Counties, signed a Local Cooperation Agreement on 30 June 1986. Funds to initiate construction were appropriated by the Fiscal Year 1985 Supplemental Appropriations Act. Construction initiation, however, has been delayed to provide the local sponsors with additional time needed to acquire the necesssary real estate and to make required relocations prior to initiation of channel work. The initial construction contract for an outlet structure from Clear Lake, is scheduled for award in December 1987.

The local sponsors are scheduled to expend $16,400,000 for land and relocations and to contribute $200,000 in cash in Fiscal Year 1987. The $4,800,000 in Federal funds programed for Fiscal Year 1988, together with the $600,000 contributed by the local sponsors, will be used to initiate construction of the outlet structure from Clear Lake, the relocation of two railroad bridges and channel rectification. Construction of the project is scheduled for completion in March 1994.

## COOPER LAKE AND CHANNELS, TEXAS

The Cooper Lake and Channels project is located about 90 miles east of the Dallas/Fort Worth Metroplex. Initial construction funds were provided in Fiscal Year 1958, however, construction was halted by court injunction on 8 December 1978. The injunction was dissolved on 16 July 1984. Construction subconsequently resumed and the project is about 20 percent complete. Public Law 99-662, the Water Resources Development Act of 1986, authorized the mitigation of fish and wildlife resources losses at this project. The initial embankment contract was awarded 11 December 1986. The final embankment contract is scheduled for award in October 1987. Completion of the overall project (except for the unscheduled recreation facilities) is scheduled for September 1992.

## CORPUS CHRISTI SHIP CHANNEL, TEXAS (1968 ACT)

The overall project is 64 percent complete. Second stage construction of retaining dikes at the South Shore Disposal Area is scheduled for award in March 1987 in a contract which also includes deepening of the channel from the Chemical Turning Basin to and including the Tule Lake Turning Basin. The construction contract for retaining works for Suntide disposal area was awarded 19 September 1986.

Funds programed for Fiscal Year 1988 will be used to complete construction of the retaining dikes for dredged material at the Suntide and South Shore, second stage disposal areas; continue dredging of the inner harbor channel from the Chemical Turning Basin to and including Tule Lake Turning Basin; and to initiate the contract for dredging from Tule Lake Turning Basin to and including Viola Turning Basin. The entire project (except for the unscheduled second mooring area) is scheduled for completion in March 1990.

## FREEPORT HARBOR, TEXAS

The plan of improvement for the project provides for the construction of a new 4,200 foot North Jetty and removal of the existing North Jetty along the entrance channel; enlargement of the entrance channel to 400 feet wide and 47 feet deep; realignment, deepening, and widening of various existing channels and turning basins; construction of a new turning basin at the upper end; rehabilitation of the South Jetty; and required relocations. The Local Cooperation Agreement was signed on 26 June 1986. Construction of the project will be accomplished with a cost sharing agreement with the local sponsor that is consistent with the cost sharing and financial concepts of the Water Resources Development Act of 1986.

Funds to initiate construction were appropriated by the Fiscal Year 1985 Supplemental Appropriations Act. Initiation of construction is scheduled for March 1987. The initial contract consists of relocating 3,700 feet of the North Jetty. A second contract for deepening the Brazos Harbor Channel and Turning Basin to 36 feet and to enlarge the upper turning basin to 1,200 feet in diameter and a depth of 45 feet is scheduled for award in May 1987. The local sponsor is scheduled to expend $3,262,000 for lands, damages, relocations, levees and spillways, and to contribute $2,000,000 in cash for Fiscal Year 1987.

Federal funds in Fiscal Year 1988, in the amount of $11,400,000, will be used to continue the jetty and dredging contracts; to initiate relocation of the Coast Guard Station; and to initiate deepening of the main channels and basins. In Fiscal Year 1988 the local sponsor is scheduled to contribute $3,800,000 in cash and to spend $5,132,000 for lands, damages, levees and spillways activities. The entire project is scheduled for completion in March 1992.

## JOE POOL LAKE, TEXAS

The Joe Pool Lake project which is located near the Dallas-Fort Worth Metroplex, has been under construction since Fiscal Year 1975, and is about 83 percent complete. The deliberate impoundment of the lake was initiated on 7 January 1986. The funds requested, in the amount of $9,000,000, for Fiscal Year 1988 will be used primarily to complete the access road, cultural resource preservation activities, project overlook area and to continue construction of the recreation facilities. Completion is scheduled for June 1990.

## LAKE WICHITA, HOLLIDAY CREEK, AT WICHITA FALLS, TEXAS

The plan of improvement for this project, authorized by Public Law 99-662, the Water Resources Development Act of 1986, includes the rehabilitation of the existing Lake Wichita Dam, including the adding of a concrete spillway and low-flow outlet works, and nine miles of channel improvements. The plan also includes a one mile grass-lined channel from the new spillway to the Wichita River along Holliday Creek. The plan would provide average annual benefits of $5,192,000 with a remaining benefit-remaining cost ratio of 1.4 to 1 at 8-5/8 percent interest rate. The total estimated cost of this plan, including an allowance for inflation, is $40,800,000. In accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986, the Federal share of the project's first cost is estimated at $27,700,000 and the non-Federal share at $13,100,000.

The initial construction contract is scheduled for award in September 1987. The $1,500,000 requested for Fiscal Year 1988, together with a local sponsor cash contribution of $300,000, will be used to continue channel construction. The local sponsor is scheduled to expend an additional $3,300,000 in Fiscal Year 1988 in obtaining a portion of the necessary lands, easements, and rights-of-way and in the accomplishment of various relocations. Completion of the project is scheduled for June 1993.

## MOUTH OF COLORADO RIVER, TEXAS

The Mouth of Colorado River project is located near Matagorda, Texas on the Gulf Coast. Construction of the East and West Jetties at the Navigation Channel entrance is complete. A contract for construction of a jetty walkway on the east jetty is scheduled for award in April 1987. Public Law 99-662, the Water Resources Development Act of 1986, provides for the Diversion features to be constructed at 100 percent Federal expense, thus shifting the responsibility for acquisition of disposal area lands for the Diversion Channel from the local sponsor to the Corps of Engineers. This has delayed initiation of further construction until these items of work can be accomplished by the Corps. Initiation of the Diversion Channel dredging and the Navigation Channel dredging are now scheduled for May 1988. Completion of the project is scheduled for June 1991.

## RAY ROBERTS LAKE, TEXAS

The Ray Roberts Lake project is located north of the Dallas/Fort Worth area and east of the city of Denton, Texas and is about 68 percent complete overall. Impoundment of the lake is scheduled to be initiated this summer.

Fiscal Year 1987 funds are being used to continue land acquisition; provide cultural resource mitigation; purchase permanent operating equipment; initiate relocation of the Tioga Sewage Treatment Plant, Lewisville Lake recreation facilities and Farm-to-Market Road 423; clear Lewisville Lake; continue boundary delineation; complete relocation of all roads, railroads, and utilities at Ray Roberts Lake; and complete the embankment, spillway and outlet works, riprap at Lewisville Dam and the stilling basin road.

The funds requested for Fiscal Year 1988 will be used to continue land acquisition and cultural resource mitigation; initiate contracts for boundary delineation, revegetation, overlook building and access roads; and complete relocation of Farm-to-Market Road 423, recreation facilities and clearing at Lewisville Lake, and relocation of Tioga Sewage Treatment Plant. The entire project is scheduled for completion in April 1991.

## SAN ANTONIO CHANNEL IMPROVEMENT, TEXAS

The project, which is located in the city of San Antonio, consists of 34.9 miles of channel and associated improvements on six separate streams of which about 81 percent has been completed. Detailed engineering and design studies on those sections of channel improvements remaining to be constructed in the metropolitan area have been completed. These studies revealed that the least costly alternative for providing flood control to the area would be two tunnels, one on San Pedro Creek, approximately 6,040 feet in length, and one on the San Antonio River, approximately 16,360 feet in length which are estimated to cost $30 million and $59 million, respectively . Channel construction, as originally proposed for these two reaches, would cost about $33 million and $99 million, respectively.

The Phase I contract, which consists of channel work near the inlet site of the proposed San Pedro tunnel was awarded 22 September 1986. The Phase II contract, which includes both tunnels and their associated inlet and outlet structures, is scheduled to be awarded in May 1987. Completion of the project is scheduled for June 1991.

## TAYLORS BAYOU, TEXAS

Construction of the project is 37 percent complete with channel rectification of the Taylors Bayou reach underway. The funds requested for Fiscal Year 1988 will be used to complete channel rectification of Taylors Bayou, initiate rectification work on Hillebrandt Bayou, and to initiate and complete the Water Control Structure and enlargement of the discharge channel into the Gulf Intracoastal Waterway. The entire project is scheduled for completion in March 1992.

## TOWN BLUFF HYDROPOWER, TEXAS
## (Fully Funded by Non-Federal Sponsor)

The existing Town Bluff Dam - B. A. Steinhagen Lake (formerly Dam "B" Lake) project was started in 1947 and completed in 1951. Its purpose is to reregulate the releases from Sam Rayburn Dam and Reservoir, and to provide head either for diversion into a canal or for a hydroelectric power plant. The plan of improvement consists of installing two 3,000 kilowatt generating units, intake and outlet facilities and switchyard equipment. The construction cost is currently estimated at $16,500,000 and costs for operation, maintenance and major replacements are estimated at $244,000 annually. The Sam Rayburn Muncipal Power Agency is the local sponsor and has provided cash contributions for the total cost of the project.

In Fiscal Year 1987, approximately $5,848,000 will be used to continue fabricating the two turbine-generator units and to initiate construction of the powerhouse currently scheduled for early this year. No Federal funds were requested for Fiscal Year 1988, nor will they be required in subsequent years for construction of the project; however, $8,000,000 of the funds placed on deposit by the local sponsor will be withdrawn in Fiscal Year 1988 to continue the construction activities. The project is scheduled for completion in March 1989.

## FISCAL YEAR 1988 PROJECT COMPLETIONS

Included in the Fiscal Year 1988 request of $130,851,000 for projects funded in prior fiscal years is $2,501,000 for the completion of all currently scheduled work on two projects. These two projects are the Albuquerque North Diversion Channel, New Mexico project and the Vince and Little Vince Bayous, Texas project.

## ALBUQUERQUE NORTH DIVERSION CHANNEL, NEW MEXICO

The project provides for the correction of a deficiency in the completed Albuquerque North Diversion Channel. Areas of the concrete channel lining have been damaged at joints located throughout the project due to inadequate design. The repair of these areas will be completed with the Fiscal Year 1988 funds; however, the study of the possible hydraulic design deficiency in the bend upstream of the Atchison, Topeka, and Santa Fe railroad bridge has not been completed. Should this also be determined to be a design deficiency that needs to be corrected, additional funds for construction of the recommended corrective measures would be required.

Funds provided in Fiscal Year 1987 are being used to complete design of the repair and to initiate construction in April 1987. The funds requested for Fiscal Year 1988 will be used to complete the repair of the damaged channel at seven specific locations. Completion of the currently authorized work is scheduled for February 1988.

## VINCE AND LITTLE VINCE BAYOUS, TEXAS

The project, in Pasadena, Texas, a suburb of Houston, is 77 percent complete with all work on Vince Bayou completed. Work on the Little

Vince Bayou continues to progress with three contracts scheduled for completion this fiscal year. The final contract, construction work on the upper 1.1 miles of Little Vince Bayou, is scheduled for initiation in April 1987 and will be completed with the requested funds. The project is scheduled for completion in April 1988.

## FISCAL YEAR 1988 DAM SAFETY ASSURANCE PROGRAM
## BUFFALO BAYOU AND TRIBUTARIES, TEXAS
## (ADDICKS AND BARKER DAMS)

The Fiscal Year 1988 request includes $3,100,000 for the continuation of modifications at one project, which has two dams, in Texas. The existing Addicks and Barker Dams and Reservoirs are located in and provide flood protection to a highly urbanized area, the Houston, Texas metroplex. Modification of the Addicks and Barker Dams is being accomplished as a result of an analysis of the dams, which has determined that these dams could fail if maximum rainfall conditions were to occur in the basin and result in a spillway design flood. Modification of the dams includes raising the main dam at Addicks, raising the main dam at Barker and armoring the ends of both structures. These proposed modifications will not diminish the current level of protection from flooding afforded by the two dams to the downstream area, nor will they materially increase the level of protection currently provided. Accomplishment of these modifications, however, will reduce the possibility that the structures could fail and, subsequently, release a wall of water through the urbanized area.

Funds currently available for Fiscal Year 1987 will be used to continue the contracts for raising the main dams and to award a contract for armoring the low ends of both dams and a final contract for construction of "T" walls at outlet structures, road crossings, and aesthetic improvements. The funds requested for Fiscal Year 1988 will be used to continue construction which is scheduled for completion in March 1989.

## OPERATION AND MAINTENANCE

The Fiscal Year 1988 request for the Operation and Maintenance Appropriation for projects and activities in the Southwestern Division is $200,857,000. The requested funds will be divided among the major funding categories as follows: about 22 percent for Channels and Harbors along the Texas Gulf coast; more than 10 percent for Navigation Locks and Dams; more than 36 percent for Flood Control Activities; about 30 percent for Multiple Purpose Power Projects; and more than 2 percent for Protection of Navigation including the Regulatory activities.

## CHANNELS AND HARBORS

The Fiscal Year 1988 request for dredging and maintaining ten projects along the Texas Gulf Coast is $44,555,000. The requested funds will provide for the continued maintenance of projects like: Houston Ship Channel, Gulf Intracoastal Waterway and Corpus Christi Ship Channel.

# LOCKS AND DAMS

The request of $21,041,000 for Fiscal Year 1988 for this category will provide for the operation of 13 Locks and Dams and the channel on the McClellan-Kerr Navigation System. Funds to provide for the operation of the remaining four locks are included in the request for each of four projects in the Multiple Purpose Power Projects category. These four locks are located at: The Dardenelle Lock and Dam, Arkansas project; the Ozark-Jeta Taylor Lock and Dam, Arkansas project; the Roberts S. Kerr Lock and Dam and Reservoir, Oklahoma project; and the Webbers Falls Lock and Dam, Oklahoma project. This navigation system, which consists of 13 Locks and Dams, four multiple purpose projects and a channel between the structures extends from the Mississippi River to the Head of Navigation at Catoosa, Oklahoma which is about 15 miles east of Tulsa.

# FLOOD CONTROL

The request of $71,260,000 for Fiscal Year 1988 will provide for the continued operation and maintenance of 67 flood control projects; seven other flood control activities; and the continuation of Major Rehabilitation work on one project. The 67 projects are located as follows: six in Arkansas; two in Colorado; eight in Kansas; one in Missouri; seven in New Mexico; 18 in Oklahoma and 25 in Texas. These requested funds will permit the effective operation of projects, like Millwood Lake in Arkansas, which collectively have prevented an estimated $469,957,000 in flood damages in Fiscal Year 1986.

# CLEARWATER LAKE, MISSOURI
## (Major Rehabilitation)

The Fiscal Year 1988 request for Operation and Maintenance of Flood Control projects also includes a request for funds to continue the major rehabilitation work at the Clearwater Lake, Missouri project. The project modification consists of building a berm (1,852,000 cubic yards of soil and rock) on the upstream face of the dam and placing a grout curtain (360 linear feet) through the center of dam on the right side. The material that will be used to build the berm will be taken from the hill that contains the spillway. This will enlarge the spillway width from 190 feet to 370 feet. An additional nine acres of land will be required for the spillway widening. The estimated cost of the major rehabilitation work is $14,200,000 with a benefit-cost ratio of 1.7 at 8-7/8 percent interest rate.

Fiscal Year 1987 funds, in the amount of $3,500,000, are being used to initiate the work with a contract scheduled for award in April 1987. The $5,000,000 requested for Fiscal Year 1988 will be used to continue construction with completion scheduled for September 1990.

# ABIQUIU DAM, NEW MEXICO

An especially serious problem has arisen at Abiquiu Dam in New Mexico. As a result of substantial carryover pools for several years, a record pool (elevation 6256) in 1985, and continued high lake levels in 1986, abutment seepage in the lower abutment sandstones has increased in volume and area and new seepage has developed in the upper abutment sandstones. This increased and new seepage has resulted in serious instability of the left abutment. Falling rock seriously damaged the outlet works flip bucket in 1986. An emergency contract to remove unstable abutment talus and repair the flip bucket was awarded in September 1986 and will be completed this month. The cost of these repairs will be about $2.5 million. To assure the long term stability of both abutments and the embankment, it is imperative that additional seepage control measures be accomplished. The present plan being considered is the design and construction of drainage adits (short dead end tunnels) in each downstream abutment. Upon approval of these design studies, work on plans and specifications will be initiated. The cost of these adits is currently estimated to be about $4,000,000.

## MULTIPLE-PURPOSE POWER PROJECTS

The Fiscal Year 1988 request for 18 multiple-purpose power projects in the Southwestern Division is $59,357,000. These projects are located as follows: six in Arkansas; one in Missouri; seven in Oklahoma; three in Texas; and one on the Texas-Oklahoma state line. Seventeen of these projects, like Bull Shoals Lake, in Arkansas have a total installed capacity of 1,719 megawatts and produced 6,233,271,000 kilowatt-hours in FY 1986. Hydroelectric generating facilities at the remaining project, Town Bluff Dam - B. A. Steinhagen Lake are, currently under construction. These 18 projects also provide one or more other benefits, including those for flood control, recreation, water supply and navigation.

## PROTECTION OF NAVIGATION

The request for the Protection of Navigation Category for Fiscal Year 1988 is $4,644,000 of which $4,584,000 will be used for the General Regulatory Function. These funds will be used primarily in connection with responsibilities associated with the wetlands of the Division area such as the marsh lands along the Gulf Intracoastal Waterway.

## FLOOD DAMAGES PREVENTED

Projects in the Southwestern Division Area are accomplishing the purposes for which they were designed and constructed. For instance, projects within the Southwestern Division that cost $3,218,339,000 to construct have prevented an estimated $4,772,490,000 in flood damages through 30 September 1986. Many of these projects have already prevented flood damages in excess of their initial construction cost without regard to the other water related benefits generated each year. A simple ratio that compares the estimated value of damages prevented, at the time they were prevented, to the actual first cost of the project clearly demonstrates the effectiveness of these flood control projects. The following table lists a reservoir project for each of seven states in the Southwestern Division that has a large flood damages prevented to construction cost, or "payback" ratio. Note that benefits from recreation, hydropower, navigation, and water supply are not included.

FLOOD CONTROL "PAYBACK"
($ Million)

| PROJECT | TOTAL COST | FLOOD DAMAGES PREVENTED | "PAYBACK" RATIO |
|---|---|---|---|
| Nimrod Lake, AR | $ 4.0 | $ 11.6 | 2.9 |
| John Martin Reservoir, CO | 15.6 | 71.9 | 4.6 |
| Fall River Lake, KS | 10.6 | 33.6 | 3.2 |
| Clearwater Lake, MO | 10.4 | 74.8 | 7.2 |
| Abiqui Dam, NM | 26.7 | 190.4 | 7.1 |
| Hulah Lake, OK | 11.2 | 95.9 | 8.6 |
| Belton Lake, TX | 17.0 | 114.8 | 6.8 |

## OCTOBER 1986 FLOOD
## OKLAHOMA, KANSAS AND ARKANSAS

This fall record rains of up to 22 inches over a five to six day period drenched portions of Oklahoma and Kansas and produced the flood of record in many areas. The large volume of water caused flood storage capacities to be exceeded at five Oklahoma projects: Kaw, Keystone, Oologah, Hulah, and Copan Lakes. Four other lakes in the area were essentially full. When the top of the flood control pool was exceeded, it was necessary to make releases to ensure that the maximum amount of flood protection could be provided. The damages resulting from this storm, in spite of the control provided, were high because the event greatly exceeded the events for which these projects were designed and constructed to control. Flooding, however, was considerably less than what would have occurred without these projects. For example, at Bartlesville the water would have been approximately 5-1/2 feet deeper without the flood control system. Runoff from rains in areas uncontrolled by Corps Dams or other structures caused some flooding along the Arkansas River and its tributaries. The W.D. Mayo Lock & Dam near Ft. Smith, Arkansas was completely under water for almost three weeks.

There were 37 projects either built by the Corps or for which Federal funds were provided by the Corps for the flood control portion of the project that played a major role in this flood fight. The preliminary estimated total damages prevented by these projects during the October flood was $890,700,000. The preliminary estimate of flood damages prevented by each of the 23 projects in Kansas and Oklahoma and the 14 levees in Arkansas during this one event is listed on the following table:

PRELIMINARY ESTIMATE OF
FLOOD DAMAGES PREVENTED BY PROJECTS
IN KANSAS, OKLAHOMA AND ARKANSAS
OCTOBER 1986

| PROJECT | FEDERAL FIRST COST | PRELIMINARY ESTIMATE OF DAMAGES PREVENTED |
|---|---|---|
| KANSAS | | |
| Council Grove Lake | $11,813,000 | $ 2,000,000 |
| El Dorado Lake | 90,279,000 | 8,400,000 |
| Elk City | 19,053,000 | 10,000,000 |

| PROJECT | FEDERAL FIRST COST | PRELIMINARY ESTIMATE OF DAMAGES PREVENTED |
|---|---|---|
| KANSAS | | |
| Fall River Lake | 10,551,000 | 8,000,000 |
| Iola Levee | 220,000 | 14,000,000 |
| John Redmond Dam and Reservoir | 28,152,000 | 23,000,000 |
| Marion Lake | 13,420,000 | 1,000,000 |
| Pearson-Skubitz Big Hill Lake | 17,027,000 | 1,200,000 |
| Toronto Lake | 13,896,000 | 12,000,000 |
| SUBTOTAL - KANSAS | $204,411,000 | $79,600,000 |
| OKLAHOMA | | |
| Birch Lake | $ 13,549,000 | $ 2,000,000 |
| Copan Lake | 89,242,000 | 60,000,000 |
| Fort Gibson Lake | 43,491,000 | 12,000,000 |
| Great Salt Plains Lake | 4,626,000 | 900,000 |
| Heyburn Lake | 2,561,000 | 200,000 |
| Hulah Lake | 11,180,000 | 80,000,000 |
| Lake Hudson | 6,909,000 | 4,600,000 |
| Kaw Lake | 109,425,000 | 90,000,000 |
| Keystone Lake | 123,771,000 | 310,000,000 |
| Oologah Lake | 46,722,000 | 30,000,000 |
| Pensacola Reservoir | 52,000 | 10,000,000 |
| Skiatook Lake | 113,300,000 | 20,000,000 |
| Tenkiller Ferry Lake | 24,058,000 | 300,000 |
| Tulsa - West Tulsa Levee | 2,785,000 | 100,000,000 |
| SUBTOTAL - OKLAHOMA | $591,671,000 | $720,000,000 |
| ARKANSAS | | |
| Fort Smith Levee | $1,078,000 | $5,400,000 |
| Van Buren Levee | 438,000 | 1,200,000 |
| Crawford County Levee | 2,002,000 | 1,800,000 |
| Cardens Bottom Drainage Dist 2 Levee | 920,000 | 1,300,000 |
| West of Morrilton Levee | 1,270,000 | 1,600,000 |
| Conway Co. Drainage & Levee Dist 1 | 187,000 | 200,000 |
| Conway Co. Levee Dist. 6 | 391,000 | 300,000 |
| Conway Co. Levee Dist 1, 8, & 10 | 1,019,000 | 1,400,000 |
| Faulkner Co. Levee Dist. 1 | 100,000 | 800,000 |
| Roland Drainage Dist Levee | 270,000 | 300,000 |
| North Little Rock Levee | 512,000 | 6,900,000 |
| North Little Rock to Gillett (Plum Bayou Levee) | 845,000 | 67,000,000 |
| Fourche Isle to Pennington Bayou Levee | 1,405,000 | 2,600,000 |
| Tucker Lake Levee | 409,000 | 300,000 |
| SUBTOTAL - ARKANSAS | $ 10,846,000 | $ 91,100,000 |
| GRAND TOTAL | $806,928,000 | $890,700,000 |

# RECREATION VISITATION

The heavy use of recreation facilities at U.S. Army Corps of Engineers projects in the Southwestern Division continued this past year as 139,700,000 visitors took advantage of these facilities. The Southwestern Division Lakes attracts more than one fourth of all visitors to recreational areas at Corps projects nationwide. This is primarily because the Division has more large lakes than other divisions and the recreation season is longer than in most other areas of the country. Visitation by states to the 1,187 recreation areas at projects within the Southwestern Division last year are shown in the following table:

1986 RECREATION VISITORS
SOUTHWESTERN DIVISION

| STATE | PROJECTS 1/ | TOTAL NO. OF RECREATION AREAS 2/ | TOTAL NO. OF VISITORS |
|---|---|---|---|
| ARKANSAS | 22 | 301 | 37,000,000 |
| COLORADO | 2 | 8 | 1,100,000 |
| KANSAS | 8 | 43 | 3,000,000 |
| MISSOURI | 2 | 216 | 7,100,000 |
| NEW MEXICO | 7 | 18 | 3,500,000 |
| OKLAHOMA | 26 | 245 | 30,500,000 |
| TEXAS 3/ | 28 | 356 | 57,500,000 |
| TOTALS | 95 | 1,187 | 139,700,000 |

1/ Reflects projects and sub-projects operated by the U.S. Army Corps of Engineers.

2/ Reflects recreation areas located at projects and sub-projects operated by the U.S. Army Corps of Engineers.

3/ Includes Denison Dam-Lake Texoma Recreation Areas and Visitation (Oklahoma - 27 areas and 5,100,000 visitors; Texas - 13 areas and 3,390,000 visitors).

# FISCAL YEAR 1986 ACCOMPLISHMENTS

The Southwestern Division had a good year in Fiscal Year 1986. The professionals in this division executed a large program, meeting or exceeding goals important to the nation, from water resource planning for the future to use of small and disadvantaged businesses. Examples of these accomplishments are:

* Administered 670 contracts valued at over $2.0 Billion (Civil Works and Military)

* Placed $100 Million in Civil Works Construction, including:

- $25.8 Million at Ray Roberts Lake
- $ 9.2 Million at Arcadia Lake
- $ 3.2 Million at Corpus Christi Ship Channel
- $ 2.6 Million at Vince and Little Vince Bayous

- **Accomplished 144% of the Civil Works Value Engineering goal**
- **Accomplished 100% of Small and Disadvantaged Business Utilization goal**

## SUMMARY

**The Southwestern Division has many water resource problems and needs in an area that extends from middle Kansas, south to the Texas Gulf Coast, and from the Rocky Mountains of Colorado and New Mexico, east to the eastern parts of Arkansas and Missouri.**

**In summary, the total request of $350,829,000 in Federal funds for Fiscal Year 1988, together with the scheduled cash contributions of $20,184,000 from the local sponsors, will help solve some of the problems and meet some of the water resource needs of the area.**

### RED RIVER CHLORIDE CONTROL, OKLAHOMA AND TEXAS

Senator JOHNSTON. Thank you very much, General Hilmes.

Tell me about the chloride control effort on the Red River. Is anything proceeding on that project?

General HILMES. Yes, sir; we are very close to completion of the area 8 segment of the Red River chloride control project. After completion, we will evaluate the effects of the area 8 portion on the salinity of the downstream water.

Senator JOHNSTON. What is the area 8?

General HILMES. It is located near Truscott, Tex., sir. We have a small inflatable dam in the river, a pumping station, along with a 22-mile-long pipeline, which transports the brine to a retention reservoir where it is permanently confined. We will divert the flow of the river during low flows to the retention reservoir. These flows are highly saline. During periods of high flows we will deflate the dam, and let these flows go down the river. With high flows, the salinity is diluted to the point that the stream contains basically good quality water.

Senator JOHNSTON. In effect, the methodology on the chloride control at area 8 would be to divert the flow of the stream at low water; is that right?

General HILMES. That is correct, sir, divert the low stream flows and let this highly saline water evaporate in the retention reservoir. At some of the other proposed areas, because of different geological conditions, the collection method is different but the end result is the same. All of the collection methods will remove a large portion of the brine before it contaminates the stream and will store it where it can do no harm.

Senator JOHNSTON. They know exactly where the salt deposits are there?

General HILMES. Sir, the location of the significant sources are known. We do not know where all of the brine pollution originates. By controlling the significant sources, however, we can accomplish the desired results.

Senator JOHNSTON. How extensive are those salt deposits?

General HILMES. Sir, area 8 has about 7 percent of the salt deposits of the whole region. So there are many thousands of tons of salt a year from area 8. Along various tributaries to the Red River, there are 10 major natural pollution sources that contribute an average of over 2,200 tons of chloride, or about 3,600 tons of sodium chloride, to the river system daily. The Red River chloride control project will, when completed, control about 65 percent of this pollution.

Senator JOHNSTON. You say you are going to do this with area 8 and, in effect, determine the success of it?

General HILMES. That is right, sir. The changes in salinity below the collection dam on the South Fork of the Wichita River will be monitored to determine the effectiveness of the area 8 project. We believe that an adequate quantitative analysis on chloride removal might be made from data collected below the area 8 pump station.

Senator JOHNSTON. Then if it is successful, what would you do? Would you do that on other stretches of the river?

General HILMES. We will have a panel, established by section 1107 of Public Law 99–662, assist us in the evaluation of the impact of area 8 on downstream salinity. The panel is to assess the improvement in water quality downstream of area 8 to determine its consistency with the water quality assumed in the development of project benefits in the economic reanalysis of the project completed in November 1980. A report on the findings of the panel is to be submitted to the Assistant Secretary of the Army for Civil Works, the Committee on Environment and Public Works of the Senate, and the Committee on Public Works and Transportation of the House of Representatives. Assuming a favorable report then we would consider the feasibility of expanding the chloride control efforts.

Senator JOHNSTON. How many similar projects would you need to have effective chloride control on the Red River?

General HILMES. There are four more systems of collection areas that would round out the total system. These systems would consist of: Area 10 on the Middle Fork and area 7 on the North Fork of the Wichita River; area 9 and the Crowell brine retention reservoir on the Middle Pease River; area 13 on the Jonah Creek tributary and area 14 on the Salt Creek tributary to the Prairie Dog Town Fork of the Red River; and area 6 and the Fish Creek retention reservoir on the Elm Fork of the Red River.

Senator JOHNSTON. Are all of those authorized?

General HILMES. Yes, sir; they are all authorized, subject to a favorable finding in the required report as to the effectiveness of the operation of area 8.

Senator JOHNSTON. What would be the cost of those?

General HILMES. The remaining cost is $137 million, sir.

Senator JOHNSTON. Do you have high confidence that it would work?

General HILMES. The technology is relatively simple. It is an inflatable dam, pumping station, a pipeline, and a reservoir for storing the high saline waters of area 8. The remaining areas to be constructed would include one deep-well injection system, four additional low-flow brine collection dams, two additional brine storage reservoirs, two well collection facilities, six pumping plants, and about 56 miles of pipeline. I am pretty optimistic about the overall plan, sir.

### PROGRESS ON NEW STARTS IN SOUTHWESTERN DIVISION

Senator JOHNSTON. General Hilmes, picking out five projects—Great Bend, Kans., Halstead, Kans., Corpus Christi ship channel, Freeport Harbor, and mouth of Colorado River, Tex.—the Congress appropriated $24.2 million for those five projects last year. The Corps has allocated only $12 million to those projects.

Why is there such a problem in using the funds requested by the administration and appropriated by the Congress?

General HILMES. Sir, most of those fund slippages were due to delays basically from our moving into the cost-sharing environment.

Many of the details of the cost-sharing agreements that would be signed with the local sponsors were dependent upon details in the Water Resources Development Act of 1986. The local sponsors naturally waited to see how those points would end up in the law. This caused delays in terms of acquiring rights-of-ways, accomplishment of necessary relocations, and has delayed completion of the local cooperation agreement in some cases.

Now that the law has been enacted, we would expect to pick up again and utilize the funds appropriated.

Senator JOHNSTON. I have some other questions in writing, but I will defer to Senator Domenici at this point.

Senator DOMENICI. Thank you very much, Mr. Chairman.

General Hilmes, it is a pleasure to be with you at the hearing. I want to thank you for the visit you made with me to New Mexico's White Sands Missile Range and a major SDI construction project. I hope you enjoyed it. I did. I hope you look forward to that major construction site in the not too distant future, as I do.

General HILMES. That was a good day, sir, and I believe we had a real profitable visit.

### NEW CONSTRUCTION STARTS IN NEW MEXICO

Senator DOMENICI. General, I also am very pleased that three of the four new starts in your Division are in my state. They are very old projects; nonetheless, we are delighted with the passage of the new omnibus water resources authorization legislation. The new starts for the Corps in my state are at Gallup, Alamogordo, and Truth or Consequences.

Now, I understand that the budget has startup money for each of those. You indicated that you are working on cost sharing with each of the communities. Might I ask: if we were able to get the cost sharing put together and start in 1988, what are we looking at in terms of a timeframe for completion of those three projects?

General HILMES. Sir, let me deal with those one at a time, Alamogordo first. Assuming all goes well, as you have just indicated, the completion date for Alamogordo is June 1991. For Puerco River, Gallup, N. Mex., the completion date is March 1990. For the Truth or Consequences project, again assuming all goes well, completion is scheduled for March 1991.

Senator DOMENICI. General, as we enter this new phase of cost sharing, are there any problems that you are running into that the committee ought to know about? Or is it merely a matter of each of the communities getting used to it and getting their particular financing package together? Or is there something specific that we ought to know about with reference to New Mexico's three projects or any other projects?

General HILMES. Sir, with respect to the three in your state, I am not aware of any significant problems with achieving the local cooperation agreements at this time. At some of the other new construction start projects, however, the shifting of responsibility for railroad relocations to the local sponsor has impacted significantly on their financing plans.

### ALBUQUERQUE NORTH DIVERSION CHANNEL, NEW MEXICO

Senator DOMENICI. The fourth project in my state of extreme importance is not listed as a new start, but obviously you are aware of the extreme situation in Albuquerque on the north diversion channels. We have to redo some work there, and you have $400,000 to continue it, do you not?

General HILMES. Sir, we actually have $500,000.

Senator DOMENICI. I am talking about the north diversion channels in Albuquerque. I believe your budget includes—I had the wrong number—$354,000 to complete the repair of the north diversion channel in Albuquerque.

General HILMES. Yes, sir; I am sorry. The amount is $354,000, not $500,000.

Senator DOMENICI. Can you discuss quickly the kind of problems we are running into and when we can go to construction with that repair work?

General HILMES. Yes, sir. The problem we ran into there is heaved concrete. The subbase beneath the concrete has eroded, particularly at the joints. We have experienced concrete heaving where it is cracked and large pieces have fallen in. We will tear the damaged concrete out. reestablish the subbase, and put in new concrete.

Bids for the repair work at seven locations are scheduled to be opened on March 26. Assuming favorable bids are received, we will award the contract and then proceed into construction.

## ABIQUIU DAM, N. MEX.

Senator DOMENICI. There is another serious situation in our state that has to do with Abiquiu Dam and seepage problems. I understand that is the case and you propose to take some corrective measures at a cost of $2.5 million. Would you tell us about it? How serious is the problem?

General HILMES. Yes, sir; we have experienced some seepage at the Abiquiu Dam. The problem is considered to be serious. It appears to have developed as a result of substantial carryover pools for several years, a record pool in 1985, and continued high lake levels in 1986. Abutment seepage in the lower abutment sandstones has increased in volume and area. In addition, new seepage has developed in the upper abutment sandstones. This new and increased seepage has resulted in serious instability of the left abutment. Falling rock damaged the outlet works this past year. An emergency contract to remove unstable left abutment talus and to repair the outlet works was awarded in September 1986. The cost of these repairs will be about $2.5 million. To assure the long-term stability of both abutments and the embankment, additional seepage control measures need to be accomplished. We have a good solution in hand, I believe. We have a completed letter report in the Division office which describes that solution. Basically we are going to insert some tunnels into the abutments which will intercept the seepage and collect the water so that it can be safely discharged.

Senator DOMENICI. And that is what the $2.5 million is for?

General HILMES. Yes, sir; the emergency repairs are scheduled to be completed this fiscal year.

Senator DOMENICI. If that process works, is that all we need, the $2.5 million?

General HILMES. I think the $2.5 million is sufficient for emergency repairs, sir. At this time, $4.0 million is the estimated total cost of the additional seepage control measures. These additional measures could be initiated in fiscal year 1988. Subject to the usual qualifications, the operation and maintenance capability for the Abiquiu Dam, N. Mex., project is $2,261,000, of which $1 million would be used to initiate the seepage control measures.

## ACEQUIAS IRRIGATION SYSTEM, NEW MEXICO

Senator DOMENICI. I have one additional question. I think you are fully aware of section 1113 of last year's water resources development bill, which includes a $40 million authorization to start the Acequias renovation program in the state of New Mexico with a state match. It is vital to a number of communities and significant areas of my state.

I have recently asked the Corps to estimate its capability to undertake the construction on this Acequias program during fiscal year 1988; that is, how much funding could they use. It is important to our state to know whether they are going to have to match and, if so, how much.

Can you tell me how close the Corps is to getting that 1988 work capability letter in to us? Where does that stand?

General HILMES. Yes, sir; you ought to be receiving a letter very shortly from Secretary Dawson describing the total situation. But I can tell you that, assuming a favorable review of our report from the Secretary's office and contingent upon the cost-sharing support of the state and the Acequia associations in identifying the project priorities, we believe, from an engineering standpoint, that about $2.7 million in construction activities can be undertaken in fiscal year 1988.

This would consist of $300,000 of the $500,000 appropriated in fiscal year 1987, $670,000 of local sponsor contributions, and $1.7 million, subject to the usual qualifications, in fiscal year 1988 funds.

Senator DOMENICI. Thank you very much, General Hilmes.

## SUBMITTED QUESTIONS

I have some other questions, and I will submit them in writing, Mr. Chairman.

[NOTE: The following questions were not asked, but were included in the hearing record for response by the Corps:]

## QUESTIONS SUBMITTED BY SENATOR DOMENICI

### PUERCO RIVER AND TRIBUTARIES, GALLUP, NEW MEXICO

Senator DOMENICI. One of the new starts involves the Gallup Flood Control Project. Unfortunately, the dollar figure that we authorized in last year's water bill was too low. Changes in design have increased the costs beyond the increase permitted in the law, and I have introduced legislation to clarify that. Would you discuss for us the reason for the redesign and the higher cost?

General HILMES. Sir, during the Continuation of Planning and Engineering effort, it was determined that additional features were economically justified and needed for a fully functional flood protection project. Public input indicated that these project modifications were also desired. The more notable additions were raising and extending the Highway Department's South Levee, excavation of a low-flow channel on the downstream end of the project and dredging of the existing Highway Department Channel. These modifications resulted in an increase of $3,110,000 in the total project cost, from the $4,190,000 shown in Public Law 99-662 to the current estimate of $7,300,000.

### ALBUQUERQUE DISTRICT STAFFING

Senator DOMENICI. What do you expect the staffing levels to be in the Albuquerque District in Fiscal Year 1988?

General HILMES. Sir, there are 197 FTEs, or Full-Time Equivalent workyears, currently assigned to the Albuquerque District for accomplishment of Civil Works activities in Fiscal Year 1987. Given the projected workload in Fiscal Year 1988 for each of the districts in the Southwestern Division, the allocation of FTEs to the Albuquerque District for Civil Works activities is not expected to change significantly from the currently allocated level.

Senator DOMENICI. What is the projection for the following couple of years?

General HILMES. Sir, given the projected workloads of each of the districts in the division and assuming the Southwestern Division's number of Full-Time Equivalent workyears remains at or near the current allocation level, the Albuquerque District's allocation of FTEs for Civil Works activities is expected to remain essentially constant at the current level.

Senator DOMENICI. What about staffing in the Planning Division?

General HILMES. Sir, allocations of Full-Time Equivalent workyears for Civil Works activities in the Southwestern Division are made each year to each of the districts as one total number of FTEs. Distribution of these FTEs to various organizational elements within the district, including the Engineering and

Planning Division, is the responsibility of the District Engineer and is based on his assessment of the workload and manpower needs of each organization for the year under consideration.

## MIDDLE RIO GRANDE FLOOD PROTECTION
## BERNALILLO TO BELEN, NEW MEXICO

Senator DOMENICI. I would appreciate your thoughts on the Albuquerque Levee Project, which I hope can go into construction soon. There is a problem over the location of where the material will come from that will be used for the levees in the Corrales area. Assuming that controversy can be settled, would it be the intention of the Corps to move as rapidly as possible on the Corrales levees, even though the initial prime effort will be taken in the Belen area?

General HILMES. Sir, the design effort on the Corrales portion of the project has been temporarily delayed until environmental issues involving the location and suitability of borrow material are resolved. The design effort will be continued when these issues are resolved. It is the Corps of Engineers' intention to initiate construction of the Corrales levees as soon as the design is complete, construction funds are appropriated, and a Local Cooperation Agreement is executed.

## ACEQUIAS IRRIGATION SYSTEM, NEW MEXICO

Senator DOMENICI. The State is working on an effort to provide its share. To that end, you could work out cost sharing on a statewide basis, or on a project-by-project basis. The latter approach would prove very slow and cumbersome. Do you intend to do everything you can to work out a streamlined, statewide approach on cost sharing?

General HILMES. Sir, a draft Local Cooperation Agreement, an LCA, is being prepared which would allow the State of New Mexico to act as the single local sponsor for all acequia systems. This would avoid submitting an LCA on each individual project for approval and could result in significant savings in both time and money in accomplishment of this work. The need for a streamlined, statewide approach has been discussed with state officials and they generally concur, contingent on appropriate actions by the New Mexico state legislature.

Senator DOMENICI. Last year, in Fiscal Year 1987, we appropriated $500,000 to begin planning on this program. The Corps has released $200,000. Once that $200,000 study is completed, does the Corps have the capability to commit the remaining $300,000 in this fiscal year to begin studies on specific sites?

General HILMES. Sir, utilization of the remaining $300,000 to begin studies on specific sites is dependent on a favorable review of the Proposed Plan of Project Report required by Section 903a of

Public Law 99-662. Assuming an expeditious review and a favorable finding, the remaining $300,000 could be used to initiate engineering design effort on six to eight specific sites.

Senator DOMENICI. Will you make every effort to move these studies forward as quickly as possible?

General HILMES. Yes, sir. These follow-on, site-specific studies will continue to receive high priority and to be intensively managed in both the district and Southwestern Division offices.

Senator DOMENICI. The $200,000 now being spent is going toward an overall study needed for your Section 903 review. Do you plan to do everything you can to move that study to Secretary Dawson just as rapidly as possible?

General HILMES. Sir, the Corps is committed to submitting the Proposed Plan of Project Report, required by Section 903a of Public Law 99-662, to the Assistant Secretary of the Army for Civil Works this fiscal year. Consequently, the necessary resources are being made available to complete the report as soon as possible. Studies for the report are progressing well and, barring any unforeseen problems, the report could reach the Assistant Secretary for review early in the fourth quarter of this year.

## ADDITIONAL PREPARED QUESTIONS FOR THE RECORD

Senator JOHNSTON. Thank you very much, General Hilmes. We appreciate your testimony. Besides the additional questions from the committee, Senator Bumpers has submitted some questions for you to answer for the record as well.

Thank you for your testimony today.

[NOTE: The following questions were not asked, but were included in the hearing record for response by the Corps:]

## QUESTIONS SUBMITTED BY SENATOR JOHNSTON

### USE OF APPROPRIATED FUNDS

Senator JOHNSTON. General, the justification material for construction projects in the Southwestern Division indicates that the funds appropriated on many have not been allocated as budgeted and have been transferred to other projects. Examples:

| Project | Appropriations | Allocations |
|---|---|---|
| Great Bend, Kansas | $1,500,000 | $ 500,000 |
| Halstead, Kansas | 1,100,000 | 400,000 |
| Corpus Christi Ship Channel, Texas | 7,000,000 | 5,700,000 |
| Freeport Harbor, Texas | 9,900,000 | 4,800,000 |
| Mouth of Colorado River, Texas | 4,700,000 | 600,000 |
| Total | $24,200,000 | $12,000,000 |

Now, as a general matter, why does the Southwestern Division appear to have such a problem in using the funds requested by the Administration and appropriated by the Congress?

General HILMES: Sir, review of the Southwestern Division's use of funds appropriated for construction during the five year period, Fiscal Years 1982 through 1986, revealed that the $717 million appropriated for 37 separate projects in this time frame were reduced slightly more than 9.3 percent for assigned savings and slippage. Of the funds remaining, less than 4.6 percent were not allocated to projects in the Southwestern Division. In programming a construction project, a long list of uncertainties affects the scheduling, including those associated with: bids received; size of the contracts; number of contracts; contractor earnings; contractor progress; project modifications; design changes due to unforeseen events; weather delays; local sponsor performance; whether the project is in the initiation or completion stage; and several others.

Considering these uncertainties, the use of more than 95 percent of the funds available from appropriations for projects in the Southwestern Division, after reduction for assigned savings and slippage, appears to be an acceptable level of funds utilization. It is noted that these percentages will vary from project to project and from year to year because of one or more of the uncertainties previously mentioned; however, the ability to reprogram funds, with Committee notification, results in optimum progress on all projects throughout the Division and the Nation.

The reduction from appropriations to actual allocations in Fiscal Year 1987 appears to be the exception rather than the rule and is primarily due to uncertainty by the local sponsors last year as to when a Water Resources Development Bill would be enacted and what that bill would contain.

## MOUTH OF COLORADO RIVER, TEXAS

Four of the examples cited were directly impacted by enactment of Public Law 99-662. For example, on the Mouth of Colorado River, Texas project, the local sponsor delayed obtaining the necessary lands for construction of the diversion channel on the basis that a Water Resources Development Act would shift this responsibility to the Federal Government. Public Law 99-662 does shift this responsibility and continuation of project construction had to be delayed to allow the U.S. Army Corps of Engineers time to make the necessary studies and acquire the required lands. Consequently, funds scheduled for use on construction of the diversion and navigation channels cannot be used in Fiscal Year 1987 as originally planned.

## FISCAL YEAR 1985 AND FISCAL YEAR 1987 NEW CONSTRUCTION STARTS

Senator JOHNSTON. Several of the projects reflecting reduced allocations are new starts either in 1985 or the current year. The Committee was led to believe that the Corps would be able to move forward rapidly with these projects. How do you explain the Corps' inability to start these projects in a timely manner?

General HILMES. Sir, in the Southwestern Division, three projects were provided initial construction funds by the 1985 Supplemental Appropriations Act and six projects were provided initial construction funds by the 1987 Appropriations Act. Schedules for initiation of construction and the Fiscal Year 1987 funding requests for these projects were predicated on expeditious actions by the local sponsor and early enactment of a Water Resources Development Law, consistent with the cost sharing and financing concepts agreed to by the Administration and the Senate Majority Leadership. Four of the nine projects are on schedule and will use the funds appropriated, less assigned savings and slippage, in Fiscal Year 1987. The remaining five projects have been delayed for reasons generally associated with Public Law 99-662.

## BOGGY CREEK, AUSTIN, TEXAS
(Fiscal Year 1985 New Start)

The Boggy Creek, Austin, Texas Project will utilize all of the funds appropriated for it, less assigned savings and slippage, in Fiscal Year 1987, with the initial construction contract award scheduled for April 1987.

## CLEAR CREEK, TEXAS
(Fiscal Year 1985 New Start)

The schedule last presented to Congress was based on design and construction of the outlet structure by the local sponsors as work-in-kind, in lieu of a 5 percent cash contribution. This was subsequently determined to be an unacceptable substitute and the work was returned to the Federal Government for accomplishment.In addition, the local sponsor has required additional time to make the necessary relocations and to acquire lands and disposal sites needed for construction activities. This has resulted in a delay in award of the initial construction contract from August 1986 to October 1987. Consequently, the funding requirements for Fiscal Year 1987 have been reduced to $500,000, which is sufficient to accomplish scheduled Engineering and Design activities.

### FREEPORT HARBOR, TEXAS (1970 ACT)
(Fiscal Year 1985 New Start)

Land acquisition, required prior to construction initiation at the Freeport Harbor, Texas project, was delayed by the local sponsor, pending enactment of Public Law 99-662. This reduced the time available and the funding requirements for contractor activities in Fiscal Year 1987 by about 50 percent.

### ALBUQUERQUE NORTH DIVERSION CHANNEL, NEW MEXICO
(Deficiency Correction)
(Fiscal Year 1987 New Start)

The funds appropriated for the Albuquerque North Diversion Channel, New Mexico project, less assigned savings and slippage, in Fiscal Year 1987, were allocated and will be used to award the contract for the deficiency correction in April 1987.

### FOUNTAIN CREEK, PUEBLO, COLORADO
(Fiscal Year 1987 New Start)

The funds appropriated for the Fountain Creek, Pueblo, Colorado project, less assigned savings and slippage, in Fiscal Year 1987, will be used for Engineering and Design activities and award of the initial construction contract in August 1987.

### FOURCHE BAYOU BASIN, LITTLE ROCK, ARKANSAS
(Fiscal Year 1987 New Start)

The Fourche Bayou Basin project will utilize all of the funds appropriated for it, less assigned savings and slippage, in Fiscal Year 1987, with the initial construction contract scheduled for award in September 1987.

### GREAT BEND, KANSAS
(Fiscal Year 1987 New Start)

The Fiscal Year 1987 appropriation for the Great Bend, Kansas project was based on accomplishment of the railroad relocations by the Federal Government. Passage of Public Law 99-662, which shifted the responsibility for railroad relocations to the local sponsor, has delayed consummation of a Local Cooperation Agreement to allow the local sponsor sufficient time to reformulate his financing plan. This has reduced the time available and funding requirements for the initial construction contract in Fiscal Year 1987 from eight months to two months and $1.0 million to approximately $50,000 respectively. The remaining $450,000 of the $500,000 allocation for Fiscal Year 1987 will be used for the Engineering and Design effort.

### HALSTEAD, KANSAS
(Fiscal Year 1987 New Start)

The scheduled award date for the initial construction contract on the Halstead, Kansas project, on which the Fiscal Year 1987 appropriations were based, was May 1987. This initial contract award date has been delayed until August 1988 to allow the local sponsor additional time to arrange the necessary financing for their share of the project. Based on this needed extension in time by the local sponsor, the financial requirements for this project in Fiscal Year 1987 reflect only those funds required for Engineering and Design activities.

### LAKE WICHITA, HOLLIDAY CREEK AT WICHITA FALLS, TEXAS
(Fiscal Year 1987 New Start)

Funds appropriated in Fiscal Year 1987 for the Lake Wichita, Holliday Creek at Wichita Falls, Texas project were based on initiation of construction in June 1987. The award date for this contract has been rescheduled to September 1987 because of delays associated with obtaining a Local Cooperation Agreement. Enactment of Public Law 99-662, which shifted the responsibility for railroad relocations to the local sponsor, and a disagreement as to the need for additional height on the dam to provide freeboard as part of the Lake Wichita Dam rehabilitation are the principle reasons for this delay. Consequently, the time available for contractor earnings has been significantly reduced and the amounts required for Fiscal Year 1987 are essentially only those funds needed for Engineering and Design activities.

### NEW CONSTRUCTION STARTS
### FISCAL YEAR 1988

Senator JOHNSTON. Will the Southwestern Division be able to fully utilize the funds requested on the four new starts proposed in the Fiscal Year 1988 budget request?

General HILMES: Sir, barring any unforeseen problems, the amounts requested for each of these four projects will be fully used.

## ALAMOGORDO, NEW MEXICO

For the Alamogordo, New Mexico project, $250,000 of the $2,000,000 requested for Fiscal Year 1988 will be used to complete Engineering and Design and to supervise and administer the work. A contract for construction of the entire project, utilizing the remaining $1,750,000 of the request, is scheduled to be awarded in June 1988.

## PUERCO RIVER AND TRIBUTARIES, GALLUP, NEW MEXICO

For the Puerco River at Gallup, New Mexico project, $250,000 of the $760,000 requested for Fiscal Year 1988 will be used to complete Engineering and Design and to supervise and administer the work. A contract for construction of the entire project, utilizing the remaining $510,000 of the request, is scheduled for award in June 1988.

## RIO GRANDE FLOODWAY, TRUTH OR CONSEQUENCES UNIT, NEW MEXICO

For the Truth or Consequences, New Mexico project, $320,000 of the Fiscal Year 1988 request for $700,000 will be used to complete Preconstruction Engineering and Design and for Supervision and Administration. The initial two construction contracts for the access road and for cultural resource preservation are scheduled for award in May 1988, utilizing the remaining $380,000 of the request.

## MINGO CREEK, TULSA, OKLAHOMA

For the Mingo Creek, Tulsa, Oklahoma project, $1,400,000 of the $2,400,000 requested for Fiscal Year 1988 are scheduled to be utilized for Engineering and Design and Supervision and Administration. The initial construction contract for channel improvements on Audubon Creek is scheduled for award in May 1988 and will utilize $600,000 of the request. The second construction contract on Mingo Creek, at 36th Street North, will require $400,000 in Fiscal Year 1988 and is scheduled for award in June 1988.

## GREAT BEND, KANSAS

Senator JOHNSTON. Please explain why only $500,000 of the $1,500,000 appropriated for the Great Bend project in Kansas is planned to be allocated during the current year?

General HILMES. Sir, the Fiscal Year 1987 funding request, associated schedules, and coordination activities with the local sponsor were based on cost sharing and financing concepts agreed to by the Administration and the Senate Majority Leadership. Subsequent to enactment of the Fiscal Year 1987 Appropriations

Act, the Water Resources Development Act of 1986 became law and in some cases this law materially impacted on the local sponsor's willingness and ability to enter into a Local Cooperation Agreement, or LCA, for construction of the project. For this project, changes in the local requirements, from those previously understood by the local sponsor to those required by Public Law 99-662, increased the local sponsor's portion of the estimated cost for the project by about 29 percent. This change has resulted in a need for the local sponsor to reexamine and develop a new plan for financing their portion of the project, prior to signing the Local Cooperation Agreement. This delay in consummation of the LCA will, in turn, delay initiation of construction. Currently, only $500,000 is required for Fiscal Year 1987. These funds will be used for the Engineering and Design effort and for award of the initial construction contract in July 1987.

Senator JOHNSTON. Why are railroad relocation costs associated with the project not included in the non-Federal cost?

General HILMES. Sir, the currently estimated cost of meeting all non-Federal requirements, including relocations, is $20,300,000.

Senator JOHNSTON. Why is this not a non-Federal responsibility as provided for in P.L. 99-662?

General HILMES. Sir, the railroad relocations for this project are a non-Federal responsibility. The local sponsor's letter, dated 7 October 1985, noted on the second page of the justifications for this project, was in accordance with the cost sharing and financing concepts anticipated at that time. Subsequent to this letter, Public Law 99-662 shifted the responsibility for railroad relocations from a Federal responsibility to a non-Federal responsibility. Discussions with the local sponsor indicate they are aware of this additional requirement and are evaluating the impact of this change.

Senator JOHNSTON. How much will the railroad relocations cost?

General HILMES. Sir, the railroad relocations are currently estimated to cost $5,000,000.

Senator JOHNSTON. Who will pay those costs?

General HILMES. Sir, the costs associated with the railroad relocations will be paid by the local sponsor, the city of Great Bend, Kansas.

### HALSTEAD, KANSAS

Senator JOHNSTON. Why has the Corps not been able to proceed with the Halstead, Kansas project as originally planned, allocating only $400,000 of the $1,100,000 appropriation?

General HILMES. Sir, initiation of construction has been delayed to permit the local sponsor to obtain necessary financing for their share of the project. At present, Halstead City Councilmen and all candidates for the Council are fully committed to providing the non-Federal share of $1.8 million. In order to save time, the Halstead City Council decided to issue bonds without an election. Kansas state law, however, requires that a city must have a population of over 2,000 people to do so. The official census in 1980 established the population at 1,994. Subsequent estimates for the Census Bureau indicate that the present population is in excess of the required 2,000. A group of nine people challenged the Council in court for not using the 1980 count of 1,994 instead of the estimated number. On 10 February 1987 a summary judgement dismissed the case by a ruling in favor of the Council. The plaintiff appealed the ruling on 24 February 1987 and it may be several months before the case is settled. In the meantime, the Securities Exchange Commission will not allow issuance of bonds, even if approved by an election, because of the pending litigation. The $400,000 allocation for Fiscal Year 1987 will be used to continue the Engineering and Design effort for the project.

### ALAMOGORDO, NEW MEXICO

Senator JOHNSTON. I note that the Federal cost estimate of the Alamogordo project has increased by $9.3 million because of design changes due to the realignment of the diversion channel. Why was the channel realignment necessary?

General HILMES. Sir, between 1964, when the original design was developed, and 1986, when the plan was reviewed, much of the real estate required for the original alignment was urbanized. The current plan includes realignment of about 12,000 feet of the diversion channel up the slope of the foothills to avoid this developed area.

Senator JOHNSTON. Was this at the request of State and local interests?

General HILMES. Sir, during the 1984 review, the Corps determined that the realignment was a physical and economical necessity if adequate flood protection was to be provided to all of the urban area of Alamogordo. If the alignment had not been changed, a large portion of the urbanized area would not receive flood protection. In addition, the cost increase associated with using the original alignment would be substantially greater than the $9.3 million increase for the current plan.

Senator JOHNSTON. Will they share in the additional cost?

General HILMES. Sir, the local sponsor will share in the additional cost in the same proportion as the rest of the project cost.

Senator JOHNSTON. Is approval of another bond issue necessary on the project in light of the failure of an earlier bond referendum?

General HILMES. Sir, the city of Alamogordo will need the approval of its citizens to issue bonds to provide its share of the costs.

Senator JOHNSTON. When is the new referendum scheduled?

General HILMES. Sir, the city of Alamogordo, New Mexico is currently planning to hold a referendum late this year.

Senator JOHNSTON. In your professional opinion, given the past history of local support, is this project likely to proceed as currently envisioned?

General HILMES. Sir, we have received letters of assurance from the city of Alamogordo, New Mexico in October 1985 and March 1986. In addition, the city has enacted a 1/4 percent sales tax, the revenues of which will be pledged to retire the bonds issued to finance the project. These letters of assurance, and the enactment of the sales tax, indicate the city of Alamogordo intends to meet the local sponsor's requirements, which will enable construction of the project to proceed as currently envisioned.

## PUERCO RIVER AND TRIBUTARIES, GALLUP, NEW MEXICO

Senator JOHNSTON. What is the benefit-to-cost ratio of the Puerco River and Tributaries, Gallup, New Mexico project which is a budgeted new start for Fiscal Year 1988?

General HILMES. Sir, the project is estimated to cost $7.3 million and will generate $1.02 million in average annual benefits, resulting in a benefit-to-cost ratio of 1.3 to 1 when evaluated at an interest rate of 8-7/8 percent.

## MINGO CREEK, TULSA, OKLAHOMA

Senator JOHNSTON. Please explain why the non-Federal cost sharing on the Mingo Creek project is a minimum of 35% or the traditional Section 221 requirements, whichever is greater.

General HILMES. Sir, the Resolution of Assurance, signed by the city of Tulsa on 26 August 1983, stated their willingness to participate in a flood protection project under the cost sharing guidance in effect at that time. This was a minimum of 35 percent or the traditional Section 221 requirements, whichever was greater.

## MINGO CREEK, TULSA, OKLAHOMA

Senator JOHNSTON. Is this in accordance with Public Law 99-662?

General HILMES. No, sir, the conditions of the 1983 Resolution of Assurance are not in accordance with Public Law 99-662. Current negotiations for a Local Cooperation Agreement are being conducted, in accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986.

## FREEPORT HARBOR, TEXAS (1970 ACT)

Senator JOHNSTON. Why is only $4.8 million of the $9.9 million appropriated for the Freeport Harbor project in Texas being allocated to the project?

General HILMES. Sir, the Fiscal Year 1987 appropriations were based on the assumption that construction could be initiated in Fiscal Year 1986 after the Local Cooperation Agreement was signed. The Local Cooperation Agreement was signed on 26 June 1986, however, it had a provision in the contract that initiation of construction was contingent upon the enactment of legislation, imposing a nationwide Federal port user fee. Local interests delayed land acquisition until the legislation, Public Law 99-662, was enacted on 17 November 1986. Consequently, award of the initial construction contract for the new North Jetty had to be rescheduled from July 1986 to March 1987.

## MCCLELLAN-KERR ARKANSAS RIVER NAVIGATION SYSTEM, ARKANSAS AND OKLAHOMA

Senator JOHNSTON. Could you review briefly the estimated tonnages of commercial traffic the Corps projected to move annually on the McClellan-Kerr navigation system and how that compares to the actual commercial traffic which moved on the system?

General HILMES. Sir, the 1943 projected tonnages of commercial traffic were generally exceeded when compared to the actual tonnages carried on this waterway. Although the annual actual movements for the last four years have been slightly lower than the projections for the year, the actual cumulative amount exceeds the 1943 projected cumulative amount by about 44.4 percent. The requested table of comparisons is supplied for the record.

[The information follows:]

### COMMERCIAL TRAFFIC
### MCCLELLAN-KERR ARKANSAS RIVER NAVIGATION SYSTEM
### ARKANSAS AND OKLAHOMA

| | ANNUAL MOVEMENTS IN MILLION TONS | | CUMULATIVE MOVEMENTS IN MILLION TONS | |
|---|---|---|---|---|
| Year | 1943 Projections | Actual Movements | 1943 Projections | Actual Movements |
| 1971* | 1.0 | 4.2 | 1.0 | 4.2 |
| 1972 | 1.1 | 6.0 | 2.1 | 10.2 |
| 1973 | 1.3 | 5.0 | 3.4 | 15.2 |
| 1974 | 1.4 | 6.0 | 4.8 | 21.2 |
| 1975 | 1.7 | 5.2 | 6.5 | 26.4 |
| 1976 | 2.0 | 6.5 | 8.5 | 32.9 |
| 1977 | 2.4 | 9.1 | 10.9 | 42.0 |
| 1978 | 4.5 | 9.9 | 15.4 | 51.9 |
| 1979 | 7.0 | 8.4 | 22.4 | 60.3 |
| 1980 | 6.1 | 8.5 | 28.5 | 68.8 |
| 1981 | 5.8 | 7.7 | 34.3 | 76.5 |
| 1982 | 7.4 | 7.8 | 41.7 | 84.3 |
| 1983 | 8.4 | 7.6 | 50.1 | 91.9 |
| 1984 | 9.4 | 8.5 | 59.5 | 100.4 |
| 1985 | 10.9 | 8.3 | 70.4 | 108.7 |
| 1986 | 11.8 | 10.0 | 82.2 | 118.7 |

*First year of full operation.

### MCCLELLAN-KERR ARKANSAS RIVER NAVIGATION SYSTEM, LOCKS AND DAMS, ARKANSAS AND OKLAHOMA
### (Cutoff Channel)
### (Wilbur D. Mills Dam)

Senator JOHNSTON. The justification material indicates two potential problems related to this project. One involves the development of a new channel and sedimentation between the Arkansas and White Rivers and the second relates to the structural integrity of Wilbur D. Mills Dam, No. 2. Briefly discuss these problems.

General HILMES. Sir, a new channel is developing across the narrow strip of land between the Arkansas and White Rivers. Should this new channel cut through, the sand-laden flows from the Arkansas could enter the White. This sediment would have to be dredged out of the White River at an estimated cost of approximately $2,000,000 annually. Construction of an overflow structure approximately three miles long appears to be the best solution to the problem. The overflow structure would extend downstream from the Union Pacific Railroad to the existing non-overflow structure that was built in 1964. This proposed plan would also provide for the construction of three short structures across existing depressions to prevent erosion of these areas. Engineering studies to determine a recommended solution to this problem are scheduled for completion in March 1987.

The problem with the structural integrity of the Wilbur D. Mills Dam, Number 2, became apparent as a result of the December 1982 flood, which caused barges to break loose and clog the tainter gates of the dam. Studies have revealed, that with a certain set of circumstances, the structure could fail. This condition exists primarily because the structure was built on piling and designed for all of the gates to operate in unison. In December 1982, the higher than normal head at this dam, combined with the clogged gates, resulted in high water velocities that caused both upstream and downstream scouring. A model study by the Waterways Experiment Station determined that the most feasible solution to this problem is to extend the stilling basin downstream. Studies to determine a recommended plan of action for corrective measures are scheduled to be completed in August 1987.

Senator JOHNSTON. How did these problems start?

General HILMES. Sir, the developing cutoff channel between the Arkansas River and White River was initiated by natural events. When the water level in the Arkansas River becomes sufficiently high, and is higher than the level in the White River, the Arkansas River spills over its bank and flows across the land between the two rivers. This tends to cut channels between the two rivers. At other times, the situation reverses and water flows from the White River to the Arkansas River with a continuation of the channel cutting action.

The problem with the Wilbur D. Mills Dam may not have come to light without the 1982 accident involving the runaway barges, which lodged against the dam and partially blocked the flows.

Senator JOHNSTON. What effect are these problems having on system operations?

General HILMES. Sir, at the present time the potential cutoff channel is not having a significant impact on system operations. However, the cutoff channel continues to develop, increasing the probability that dredging will be required in the White River Entrance Channel of the McClellan-Kerr Navigation System.

The damages to Wilbur D. Mills Dam that occurred as the result of the accident have been repaired. There is no impact on current system operations. The modification to the dam being studied, if constructed, would insure the safety of the dam, if a similar event should occur.

Senator JOHNSTON. What is the potential budgetary impact of these two problems over the next several years?

General HILMES. Sir, sufficient funds to continue engineering studies on the developing cutoff channel are contained in the Fiscal Year 1988 request for the McClellan-Kerr River Navigation System project. Following completion of the Engineering and Design effort, and a subsequent decision to initiate construction of the solution, as much as $15 million could be required over a three year construction period.

The Fiscal Year 1988 request for the McClellan-Kerr Navigation System project also contains an amount to continue engineering studies of the stability problems at the Wilbur D. Mills Dam. Following completion of the Engineering and Design effort, and a subsequent decision to initiate constrution of the solution, an estimated $7.5 million could be required over a two year construction period.

## QUESTIONS SUBMITTED BY SENATOR BUMPERS

### MCCLELLAN-KERR ARKANSAS RIVER NAVIGATION SYSTEM (HYDROPOWER)

Question. Under a study authority I sponsored, the Little Rock and Tulsa Districts produced four reports on adding hydropower facilities to the existing structures on the McClellan-Kerr Arkansas River Navigation System. What is the status of that study?

Answer. Four interim reports have been submitted to higher authority for processing. Further studies have been suspended because of the current policy that hydropower development is a non-Federal reponsibility.

### FEDERAL HYDROPOWER

Question. What do you see as the future federal involvement in federal hydropower?

Answer. In view of the Federal deficits, current policy is to concentrate Corps efforts on high-priority water resource concerns associated with navigation and flood control. Consequently, for the near term, there is little opportunity for Federal development of hydropower. However, the Corps is playing a major role in reviewing non-Federal hydropower plans for technical adequacy and for ensuring that the proposals do not adversely affect existing project purposes.

### CLOVERDALE, ARKANSAS

Question. In the Water Resource Development Act of 1986 there is a provision that permits the Corps to ignore its criteria for the minimum size drainage area and flow characteristics required for Federal involvement in small flood reduction projects. I understand the Corps turned down a project in the Cloverdale area of Little Rock based on its not meeting the required criteria. In view of the language in the Water Resource Development Act, will the Cloverdale decision be reconsidered?

Answer. Policy to implement Public Law 99-662, the Water Resources Development Act of 1986, as it pertains to flood control projects for small drainage areas, is currently being formulated. When this policy is issued, the Cloverdale Drain project could be reconsidered.

## BULL SHOALS LAKE, ARKANSAS

Question. The Fiscal Year 1987 Continuing Resolution prohibits the disposal of surplus land at Bull Shoals Lake for this fiscal year only. What are your plans for disposing of land at Bull Shoals after this fiscal year?

Answer. Lands determined excess to the Bull Shoals Lake project were reported to Region 7 of the General Service Administration, 450.87 acres, and to the Bureau of Land Management, 315.39 acres, on November 29, 1984. Control of these excess lands has passed from the Corps to these agencies. No additional lands have been identified as excess at Bull Shoals Lake.

## NORFORK LAKE, ARKANSAS

Question. What is the status of the disposal of lands at nearby Norfork Lake?

Answer. Land at the Norfork Lake project that has been determined to be excess to project requirements will be reported to Region 7, General Services Administration, 314.5 acres, and Bureau of Land Management, 73.1 acres, during March 1987.

## MCCLELLAN-KERR NAVIGATION SYSTEM, ARKANSAS

Question. In the past year the operational plan for the McClellan-Kerr Navigation System has been revised. Please provide a report on the effects of this revised plan on flood protection and on navigation and farming in the Arkansas portion of the system.

Answer. The revised plan was placed in operation in July 1986. To date it has been used to regulate releases from only one significant flood, that being the flood of October 1986. With the revised plan, flows were reduced to the more acceptable level of 75,000 cubic feet per second in five days less time than would have been required with the old plan. This, in effect, produced five days of more favorable navigation and five fewer days of flooding on the bulk of low-lying farm lands along the river. The overall performance of the plan during this flood event was good. The plan met the objectives in the Arkansas reach of the river and also allowed a reasonable evacuation time for the flood waters stored in the upstream Oklahoma flood control lakes. Because of concerns that have been expressed, continued evaluation of this plan, as well as other operational plans, will be made in more detail in conjunction with the ongoing Arkansas River Basin Feasibility Study, Arkansas and Oklahoma.

Question. In the past few years the Corps has been studying problems on the McClellan-Kerr Arkansas River Navigation System. I understand that the bank stabilization work in the entrance Channel and high rock removal in Pool 7 are under contract. The Corps now advises that an additional lock and dam is needed on the White River, because, during periods of low flow in the Mississippi River, navigation is delayed. Does this mean the Mississippi River is cutting deeper, thereby reducing the volume in the White River?

Answer. The technical, economical and environmental feasibility and the need for an additional lock and dam on the lower White River has not yet been determined. The recent history of the Mississippi River has been that, for a given flow rate, the channel bottom and the water surface elevation of the Mississippi River at the White River confluence has shown a downward shift. This could be cyclic. The Mississippi River is a dynamic system and the trend could continue to be down or it could reverse itself and start to move upward. Many complex factors are involved in those forces which alter the shape of such waterways as the Mississippi River. Not all of them are understood or predictable.

## MISSISSIPPI RIVER

Question. Has the Corps' work on the Mississippi contributed to this condition?

Answer. The impact of the Corps' work on the Mississippi River, or any of the other factors on changes taking place in the vicinity of the White River, have not been determined. The channel rectification and bank stabilization efforts conducted by the Corps during the past 50 or more years have done much to establish reliable navigation conditions on the Mississippi River. This work along with upper basin developments and past Mississippi River Basin runoff conditions have impacted on the physical channel changes going on continuously over every reach of the river, with some reaches being affected completely different from others.

Question. When do you expect to be able to recommend a solution to the low-flow problem that will not be detrimental to either the Mississippi River or Arkansas River navigation systems?

Answer. Subject to the availability of funds and assuming current model tests result in a potential technical solution to the problem that is not detrimental to either the Mississippi River or the Arkansas River Navigation System, studies leading to a recommended plan of improvement are scheduled for completion in 1990.

## ARKANSAS RIVER-WHITE RIVER
## (Cutoff Structure)

Question. The Corps recommends the building of a lock and dam in the White River, and I understand the Corps also plans to recommend building the Arkansas River-White River cutoff structure to prevent sand from the Arkansas River from depositing in the White River. Would it not be more economical to build the cutoff structure from Lock 2 to the existing cutoff structure with a road on top for access to the new lock and dam in the White River?

Answer. Studies as to the need for an additional lock and dam and as to the need for an overflow structure, to be constructed between the Arkansas and White Rivers, are currently underway . If an overflow structure was built, it would extend from the Union Pacific Railroad downstream to the existing Arkansas-White Closure Structure. This structure would be designed to prevent a cutoff from occurring between the rivers and would allow controlled flow from both rivers to interchange freely at different locations for different stage frequencies. A new overflow levee or roadway from Lock 2 to the existing cutoff structure, or to the possible site of a new lock and dam, should it be needed and subsequently constructed, would be much more costly than the overflow structure currently being considered. The purposes of these potential structures are too different to incorporate both the access road and overflow in a single structure.

## NORTH LITTLE ROCK, ARKANSAS

Question. It has been thirty or forty years since there has been water against the North Little Rock Floodwall and Levee and some people think it will never occur again. This last October's flood could have been much worse if another storm of the same magnitude had followed the storm that hit Oklahoma. Also, many permits have been denied on the North Little Rock side of the river because of the fear that development would raise the flood height over the floodwall and levee. With the nation investing $1.3 billion in the navigation system, it seems short-sighted to prevent development along the river. Considering this and the fact that the Little Rock side has more protection, shouldn't the Corps recommend that the North Little Rock Floodwall and Levee be raised to protect the citizens of North Little Rock and allow full development of the McClellan-Kerr Arkansas River in this area?

Answer. An engineering analysis to determine if the levee and floodwall were adversely impacted by the McClellan-Kerr Arkansas River Navigation project is being performed. A recommendation as to the need and authority for corrective measures to restore the protection originally provided by the levee and floodwall will be formulated following completion of the analysis.

## ARKANSAS LEVEES

Question. Other Corps-built levees in Arkansas are approaching the end of their economic life. I realize that they have been turned over to the local levee boards to maintain, but, in many cases, the original board members are no longer living and some boards are no longer functional. Does the Corps have plans to review these levees and recommend an overhaul of them?

Answer. The Corps performs regular, periodic inspections of these levees and is, therefore, in contact with the local levee boards at that time. If the local levee board is ineffective or nonfunctioning, the Corps attempts to secure other local or state sponsors. The repairs of any deficiencies noted at these inspections are the responsibility of the local sponsor. If local interests do not make these repairs, Federal funds will not be used in the future to repair any levee flood damage. A report of maintenance deficiencies on all local protection projects specifically authorized by Congress, throughout the country, is submitted to Congress annually. Review of the levees along the mainstem of the Arkansas River is being accomplished as a part of the Arkansas River Basin, Arkansas and Oklahoma, Feasibility study.

### ARKANSAS RIVER FLOODING

Question. There have been numerous complaints of flooding along the Arkansas River and its tributaries. Does the Corps study flood problems of the tributaries at the same time studies are performed on the main river?

Answer. The Corps normally studies flood problems on the tributaries as well as those on the main river during the course of a General Investigation study. These flood control studies, however, must be cost shared with a local sponsor in accordance with the Water Resource Development Act of 1986.

### MCCLELLAN-KERR ARKANSAS RIVER NAVIGATION SYSTEM, LOCKS AND DAMS, ARKANSAS AND OKLAHOMA

Question. I have stated on many occasions that the McClellan-Kerr Arkansas River Navigation System project should not, under any circumstances, be closed out while such flooding and other vitally important issues remain unresolved. Do you agree that the project should continue to be authorized and funded while these issues exist?

Answer. While there are still issues in the system, as you pointed out, those basic features of the McClellan-Kerr Arkansas River Navigation System required for the current and near-term levels of traffic were completed in the early 1970s. In accordance with current policy, all additional work on the McClellan-Kerr Navigation System will be treated as a separable element, and as such, must meet the tests associated with all new Federal investments. In addition, any future elements proposed for construction, that would provide flood control, will be required to meet the cost sharing and financing concepts set forth in the Water Resources Development Act of 1986. Further, any studies of potential work, with funds provided by the Construction, General (CG) appropriation, will compete with ongoing construction projects throughout the Nation for limited funds. While we can make the current system work, at least for now, ongoing studies would be more appropriately continued with funds provided by the General Investigation appropriation, using the authority for Review of Completed Projects, or perhaps with the Operation and Maintenance appropriation. Subsequent construction, if recommended, should be accomplished either through the Operation and Maintenance program or as a separable construction project, under the CG appropration.

## BEAVER LAKE, ARKANSAS

Question. I understand that there may be a problem with the safety of Beaver Dam in Arkansas. If so, I would expect the Corps to evaluate the problem as quickly as possible and provide a report and recommendations to Congress. What is the status of this situation?

Answer. The reconnaissance report on the problem at the Beaver Lake, Arkansas project was approved on 28 August 1986. The report recommended that modifications of Beaver Dam, to control major seepage within the faulted foundation area beneath Dike No. 1 and the main embankment, be accomplished by the construction of a concrete diaphragm cutoff wall. Preparation of a Feature Design Memorandum is underway and scheduled for completion in September 1987. Plans and Specificiations, required for initiation of construction, are scheduled for completion in November 1987. Subject to the usual qualifications, the project has a Fiscal Year 1988 Operation and Maintenance, General capability in the amount of $4,621,000, an additional $1,115,000 over the budget request, of which $1,000,000 would be used to initiate the Major Rehabilitation construction in April 1988.

## DAM SAFETY PROGRAM

Question. Congress passed a Dam Safety Program for non-Federal dams. Do you think we need a similar program for Federal dams?

Answer. A similar program for Federal dams already exists. A Presidential memorandum, dated April 23, 1977, directed Federal agencies to review procedures and criteria involved in the design, construction, operation and regulation of dams. Agency reviews and the assessment of the reviews by an ad hoc interagency committee of the Federal Coordinating Council for Science, Engineering and Technology and by an Independent Review Panel of recognized experts from the academic and private sectors, showed that sound practices are generally being used. These reviews culminated in publication of the "Federal Guidelines for Dam Safety" in June 1979. The Corps of Engineers complies with these guidelines. Federal dam safety continues to be monitored and reviewed by the Interagency Committee on Dam Safety, chaired by the Federal Emergency Management Agency.

Question. Are the other Federal dams in your division in Arkansas safe?

Answer. There are no unsafe U.S. Army Corps of Engineers dams under the jurisdiction of the Little Rock District in the State of Arkansas. The Corps' dams in the State of Arkansas are inspected periodically for all aspects of safety. Any dam that would be found to have a potential for failure would be immediately drawn down or drained, if dangerous.

## GREERS FERRY LAKE, ARKANSAS

Question. When the Greers Ferry Lake was constructed, the water supply for the city of Heber Springs, Arkansas was relocated. Prior to that, it was getting its water from the Little Red River. During the 97th Congress, I introduced legislation that would allow the city to have an allocation of 2,090 acre-feet of conservation storage for water supply from the lake at no cost to the city. What is the status of the city's water supply and its need to pay for water?

Answer. There are no actions pending. Should legislation be passed, or the city make an application for water supply storage, the necessary contracts, under the law existing at the time of application, would be processed by the Corps to the Assistant Secretary of Army for Civil Works for his consideration and signature.

## ARKANSAS RIVER, ARKANSAS

Question. In recent years there has been growing interest in providing for some small use of the Arkansas River for agricultural purposes. Because such authority has never been formally granted, farmers have faced serious problems with water levels which could not be modified to accommodate critical situations. Would you be willing to lend your support to efforts to extend the authorized purposes of the waterway to include agricultural usage as long as such usage is consistent with the previously authorized purposes and does not interfere with those purposes?

Answer. The addition of a project purpose to add a small amount of agricultural water supply to the McClellan-Kerr Navigation System would be supported by the U.S. Army Corps of Engineers. This addition would, however, require changing the authorization for reallocation of storage in one or more of the various reservoirs upstream if a dependable yield is to be provided. In accordance with the Water Resources Development Act of 1986, 35 percent of the cost of this small amount of storage would have to be paid for by a non-Federal sponsor.

## NORTH CENTRAL DIVISION

## STATEMENT OF BRIG. GEN. JOSEPH PRATT, DIVISION ENGINEER

ACCOMPANIED BY:
BING C. CHIN, CHIEF, PROGRAM DEVELOPMENT OFFICE
KEN H. MURDOCK, CHIEF, PLANNING DIVISION
ZANE M. GOODWIN, CHIEF, ENGINEERING DIVISION
LEE R. HOGLIND, CHIEF, TECHNICAL ENGINEERING BRANCH

### INTRODUCTION OF ASSOCIATES

Senator JOHNSTON. General Pratt, welcome to the committee. Please introduce your assistants, and then proceed.

General PRATT. Thank you, sir. I am Joe Pratt, the Division Engineer for North Central Division. It is my pleasure to appear before your committee today.

With me is Bing Chin, the Chief of my Programming Office; Ken Murdock, the Chief of my Planning Division; Zane Goodwin, the Chief of my Engineering Division; and Lee Hoglind, the Chief of my Technical Engineering Branch.

### AREA OF RESPONSIBILITY

Our area of responsibility covers the North Central United States from North Dakota to the Saint Lawrence River and from Canada to within 50 miles of St. Louis. The Division area covers over 400,000 square miles and includes 20 percent of the U.S. population in 95 congressional districts. We have five district offices. They are located in Buffalo, N.Y.; Detroit, Mich.; Chicago and Rock Island, Ill.; and St. Paul, Minn.

A large portion of the North Central Division's annual budget is devoted to operating, maintaining and rehabilitating existing facilities. The Division operates and maintains navigation improvements at 72 commercial channels and harbors, 42 commercial locks and approximately 900 miles of navigable waterways on the Mississippi and Illinois Rivers. In addition, we operate and maintain 16 reservoirs primarily for flood control.

### FISCAL YEAR 1988 BUDGET REQUEST

I would like to present a summary of our fiscal year 1988 budget request and report on some of the accomplishments in our civil works program.

Our fiscal year 1988 budget request totals over $300 million and is summarized on this slide. This request is $63 million more than the fiscal year 1987 allocation, with the increase primarily in operation and maintenance and in the construction program. I will address the specifics later in my testimony.

### GENERAL INVESTIGATIONS

The fiscal year 1988 budget request for general investigations includes funds for 15 surveys and 9 preconstruction engineering and design projects. We have four new starts.

In fiscal year 1988, we are scheduled to complete the three studies shown here. The first two are feasibility studies for flood control and the third is a comprehensive study. With the exception of the Maple River portion, we will also complete one preconstruction engineering and design project at Sheyenne River, N. Dak.

I would like to highlight a few of our major general investigations studies and projects.

### DES PLAINES RIVER, ILL.

We are requesting funds for a new start for a study of the flood problems in the Des Plaines River, Ill. Last September, the basin was hit with a record flood that caused damages of about $35 million to about 10,000 homes and 260 businesses. Over 15,000 people were evacuated during the high water.

### SAGINAW RIVER, MICH.

The Saginaw River basin in Michigan also suffered severe flood damages in September 1986. The floods of record occurred on the Tittabawassee River and the Cass River. Over 4,000 families were evacuated and over 600,000 acres of crops were destroyed. The feasibility phase of this study will continue in fiscal year 1988, with my report scheduled for June 1989.

### BUFFALO METROPOLITAN AREA, N.Y.

In February 1985, the Tonawanda Creek basin in the Buffalo metropolitan area suffered $5 million in damages from flooding. The basin continues to experience recurring flooding. Ice jam flooding continues to be almost an annual problem. The study will develop alternative plans to reduce future damages.

### FORT WAYNE, IND.

At Fort Wayne, Ind., we will complete a survey report on the flood problems this fiscal year. Our fiscal year 1988 request will allow us to start preconstruction engineering and design for this project. In 1982, the second worst flood on record at Fort Wayne caused over $35 million in damages. The benefit-to-cost ratio for the Fort Wayne project is 2.7 to 1.

### LITTLE CALUMET RIVER, IND.

The authorized project for the Little Calumet River in Indiana includes 22 miles of levees and floodwalls to protect parts of the communities of Hammond, Munster, Highland, Griffith and Gary. The project authorized in the Water Resources Development Act of 1986 differs from the plan recommended by the Chief of Engineers by calling for more structural and less nonstructural protection. We are working to resolve those differences.

### MUSCATINE ISLAND, IOWA

The Muscatine Island, Iowa, project will provide 200-year flood protection from high water on the Mississippi River for over 30,000 acres of farmland and a portion of the city of Muscatine. The benefit-to-cost ratio for this project is 5.4 to 1.

### ROOT RIVER AT HOUSTON, MINN.

At Houston, Minn., a 100-year flood on the Root River would cause almost $15 million in damages and reach an average depth of 4 feet over most of the city. The proposed project at Houston has a benefit-to-cost ratio of 2.0 to 1.

### SHEYENNE RIVER, N. DAK.

The current Sheyenne River, N. Dak, project has three major features: Levees and a diversion channel at West Fargo and Riverside, a diversion channel from Horace to West Fargo, and a 5-foot raise of the flood pool at Baldhill Dam. This project will protect over 2,000 residents and 50,000 acres of agricultural land. The current benefit-to-cost ratio for this project is 7.4 to 1. The Maple River improvements will be reevaluated to meet the authorization contained in Public Law 99–662.

### CONSTRUCTION, GENERAL

Now, a few words on our construction, general program: In fiscal year 1987, we will complete the $16 million Bettendorf, Iowa, flood control project. We are continuing with construction of the levees and floodwall, and all work is scheduled for completion this summer.

The fiscal year 1988 budget request includes 15 construction projects. Fiscal year 1988 funding will provide for the new construction starts on the three projects shown here. These projects, when completed, will provide much needed reduction of flood damages.

Now, I would like to briefly discuss the status of our continuing construction projects. First of all, the North Central Division has made good progress on six of the seven new construction projects as part of the fiscal year 1985 supplemental appropriations bill. The local cooperation and financing arrangements for six projects were completed on time to start actual construction in 1986. The remaining project at Cleveland Harbor, Ohio, was not started because no local cooperation agreement was executed.

### UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT PROGRAM

The implementation of the upper Mississippi River system environmental management program will be continued with the funds requested in fiscal year 1988. The major portion of the funds requested will be for habitat rehabilitation and enhancement projects. The long-term resource monitoring activities are being developed to determine if the habitat projects are working and to indicate whether the river system is regaining its lost habitat or if degradation is continuing. Over 25 percent of the requested funds are for a habitat rehabilitation and enhancement project at Dresser Island, Mo.

### ELLICOTT CREEK, N.Y.

The contract was awarded for the Ellicott Creek, N.Y., project on August 15, 1986, and construction initiated later that month. In fiscal year 1988, we will continue channel and relocation construction in the project. The work is currently 11-percent complete. We should complete the entire project in September 1989.

### BASSETT CREEK, MINN.

The funds requested for Bassett Creek, Minn., will be used to initiate construction of the second phase of the upstream improvements and complete the first phase of the tunnel construction. This project, when completed, will provide flood protection to 222 homes and 18 industries located in the flood plain and numerous commercial and industrial developments in the Minneapolis area.

### LAKE DARLING, SOURIS RIVER, N. DAK.

The Lake Darling, Souris River, N. Dak., project is being modified to be consistent with the new authorization contained in the Water Resources Development Act of 1986. The Senate Report 99–441 on the fiscal year 1987 appropriations requested that our project plan be reported to the committee during these hearings.

Major project features include the purchase of flood storage in the proposed Rafferty and Alameda Reservoirs in Saskatchewan, Canada; the modification of the gated outlets at Lake Darling Dam; the construction of levees at Sawyer, Velva and levee improvements for six subdivisions between Burlington and Minot; and the existing improved channel at Minot, N. Dak.

Other items include flood proofing, relocation, or acquisition of rural residences downstream of Lake Darling and the purchase of flowage easements; modifications to and dam safety for the U.S. fish and wildlife structures in the upper Souris, and J. Clark Salyer National Wildlife Refuges. We will also include compensation to Manitoba, Canada, for altered return flows and a downstream flood warning system.

The funds in fiscal year 1988 will continue construction of the levee improvements for the six subdivisions between Burlington and Minot; initiate construction of the Sawyer levee improvements, the downstream rural improvements and the refuge structure modifications; and will provide partial payment to Canada to meet the province of Saskatchewan's construction and payment schedule. Funds will also be used for continued engineering and design work. The success of the project is dependent upon the U.S. commitment of funds to meet Saskatchewan's schedule. When completed, the project will provide 100-year flood protection at Minot, N. Dak.

### MANKATO AND NORTH MANKATO, MINN.

The Mankato-North Mankato project in Minnesota is 81 percent complete, as compared to 69 percent last year. The Main Street Bridge was completed and opened to traffic on November 11, 1986. The requested funds in fiscal year 1988 will be for construction of the Highway 169 Bridge over the Blue Earth River and for completion of the railroad bridges between Le Hillier and Mankato.

Our fiscal year 1988 operation and maintenance summary is shown on this slide. The $42 million increase in fiscal year 1988 is due to major rehabilitation and diked disposal programs and major maintenance projects.

### MAJOR REHABILITATIONS

North Central Division has many navigation structures over 50 years old, and many require major rehabilitation to assure their continued service. This budget year we have nine continuing major rehabilitations underway. Included are repair of the pier and breakwater structures at Milwaukee Harbor, Wis.; four projects on the Illinois Waterway at Brandon Road, LaGrange, Peoria and Marseilles locks and dams; and four projects on the Mississippi River. The first are at locks and dams 3 and 5A to 9, and the others are at locks and dams 20, 21 and 22. The major rehabilitation work at the lock sites consists of replacement of tainter gates, lock machinery and resurfacing of deteriorated concrete surfaces. In addition to the nine continuing projects, we also will initiate the rehabilitation of the breakwater at Calumet Harbor, Ill., and Ind.

### DIKED DISPOSAL PROGRAM

There continues to be a need for confining polluted dredged material in order to maintain some of our Great Lakes navigation projects. The fiscal year 1988 budget request includes almost $14 million in the diked disposal program to continue construction of three facilities and to complete the Keweenaw Waterway, Mich., project. In the future, additional disposal facilities that are needed will be constructed under regular project authorities.

The fiscal year 1988 operations and maintenance program will provide sufficient funds to operate and maintain the Great Lakes and upper Mississippi River navigation systems which serve the needs of commercial navigation and support the economic growth of the nation.

### 1986 RECORD FLOODING

In 1986, record flooding occurred at several locations in the North Central Division due to extremely heavy September rains. As I previously stated, the Des Plaines River basin in Illinois was hit with a flood of record at Gurnee, Des Plaines, Riverside and other Illinois communities with damages over $35 million.

The Saginaw River basin flooding I previously mentioned was part of a record flood event through the midsection of the lower peninsula of Michigan that affected 28 counties. Rainfall amounts of 8 to 13 inches occurred in the area over a 48-hour period. Total damages approaching $400 million have been estimated by the state for this event, of which $275 million occurred in the Saginaw River basin.

During this same period, heavy rains and flooding occurred along the upper Mississippi River and its tributaries, and numerous communities were flooded throughout the region.

## GREAT LAKES HIGH WATER LEVELS

The Great Lakes, in particular Lakes Michigan-Huron, St. Clair and Erie, have set all-time records for high water levels. The levels are already the highest they have been in this century, and it appears they will go still higher this spring. Lakes Michigan-Huron and St. Clair established a new set of monthly record high water levels in 1986. Forty-three out of a possible sixty monthly records were broken in 1986. While Lake Ontario has not set records, the releases in the Saint Lawrence River for the last year have been at record flows.

The unprecedented high lake levels are the result of above-normal precipitation over the Great Lakes basin in 13 out of the last 15 years. This effect has been compounded by the lower-than-normal evaporation rates due to cooler air temperatures over the lakes.

Extreme hardship has been caused to the shoreline property owners by the flooding and erosion resulting from the combination of these record high levels and storm events. Fortunately, there were few major storms in the basin during this period or the damages could have been much higher.

## EMERGENCY ADVANCE MEASURES

Due to the continuing high water levels on the Great Lakes, the Corps of Engineers initiated an advance measure program, under Public Law 84–99 authority, to help reduce damages from this unusual flood threat. During 1985 and 1986, Michigan, Ohio, Illinois, Minnesota, Wisconsin and New York requested assistance under this program. Twelve projects have been completed or are underway, as shown on this slide. These projects are being cost shared at 70 percent federal and 30 percent nonfederal.

In addition to the advance measure program, in October 1986, Mr. Dawson, the Assistant Secretary of the Army for Civil Works, approved a new self-help program for the Great Lakes states. This program includes distribution at full federal cost of sandbags, sand and plastic sheeting, as shown here, to enable the affected communities to provide flood protection. The estimated cost of this program is over $6 million.

## SUPPORT TO INTERNATIONAL JOINT COMMISSION

We continue to provide considerable support to the International Joint Commission relating to the United States-Canadian boundary waters within our area. In particular, we have been very busy in supporting the IJC boards in dealing with the Great Lakes' record high water levels. We stand ready to provide assistance to the IJC, especially as related to the new study requested by the governments on the Great Lakes' high water levels.

As always, I am proud of the men and women of the North Central Division. They stand ready to provide dedicated service to the people of the region. We look forward to meeting the challenges of water resources development in our area in fiscal year 1988.

General PRATT. Mr. Chairman and members of the committee, this concludes my status report, and I would be pleased to answer any of your questions.

[The statement follows:]

## STATEMENT OF BRIG. GEN. JOSEPH PRATT

MR. CHAIRMAN, AND MEMBERS OF THE COMMITTEE, I AM JOE PRATT, THE DIVISION ENGINEER FOR NORTH CENTRAL DIVISION. IT IS MY PLEASURE TO APPEAR AGAIN BEFORE YOUR COMMITTEE AND TO REPORT ON THE DIVISION STATUS. WITH ME IS BING CHIN, MY CHIEF OF PROGRAMS; KEN MURDOCK, CHIEF, PLANNING DIVISION; ZANE GOODWIN, CHIEF, ENGINEERING DIVISION; AND, LEE HOGLIND, CHIEF OF TECHNICAL ENGINEERING.

OUR AREA OF RESPONSIBILITY COVERS THE NORTH CENTRAL UNITED STATES, FROM NORTH DAKOTA TO THE ST. LAWRENCE RIVER, AND FROM CANADA TO WITHIN 50 MILES OF ST. LOUIS. THE DIVISION AREA COVERS 428,000 SQUARE MILES AND INCLUDES 20 PERCENT OF THE U.S. POPULATION, INCLUDING 95 CONGRESSIONAL DISTRICTS. WE HAVE FIVE DISTRICT OFFICES. THEY ARE LOCATED IN BUFFALO, NEW YORK; DETROIT, MICHIGAN; CHICAGO AND ROCK ISLAND, ILLINOIS; AND ST. PAUL, MINNESOTA.

A LARGE PORTION OF THE NORTH CENTRAL DIVISION'S ANNUAL BUDGET IS DEVOTED TO OPERATING, MAINTAINING, AND REHABILITATING EXISTING FACILITIES. THE DIVISION OPERATES AND MAINTAINS NAVIGATION IMPROVEMENTS AT 72 COMMERCIAL CHANNELS AND HARBORS, 42 COMMERCIAL LOCKS, AND APPROXIMATELY 900 MILES OF NAVIGABLE WATERWAYS ON THE MISSISSIPPI AND ILLINOIS RIVERS. IN ADDITION, WE OPERATE AND MAINTAIN 16 RESERVOIRS PRIMARILY FOR FLOOD CONTROL.

I WOULD LIKE TO PRESENT A SUMMARY OF OUR FISCAL YEAR 1988 BUDGET REQUEST AND REPORT SOME OF NCD'S ACCOMPLISHMENTS IN OUR CIVIL WORKS PROGRAM.

OUR FY 88 BUDGET REQUEST TOTALS ABOUT $300 MILLION AND IS SUMMARIZED ON THIS SLIDE. THIS REQUEST IS $63 MILLION MORE THAN THE FY 87 ALLOCATION, WITH THE INCREASE PRIMARILY IN OPERATION AND MAINTENANCE AND IN THE CONSTRUCTION PROGRAM. I WILL ADDRESS THE SPECIFICS LATER IN THE TESTIMONY.

BUDGET SUMMARY
NORTH CENTRAL DIVISION
($000)

| | FY 1987 ALLOCATION | FY 1988 REQUEST | INCREASE OR DECREASE |
|---|---|---|---|
| SURVEYS | $ 5,466.0 | $ 4,868.0 | $- 598.0 |
| PRECONSTRUCTION ENGINEERING AND DESIGN | 3,342.0 | 2,455.0 | - 887.0 |
| CONSTRUCTION | 25,208.0 | 50,801.0 | + 25,593.0 |
| MAJOR REHAB (CONTINUING) | 5,256.0 | 1,914.0 | - 3,342.0 |
| OPERATION AND MAINTENANCE | | | |
| PROJECT O&M | 157,677.0 | 197,796.0 | +40,119.0 |
| MAJOR REHABILITATION | 39,998.0 | 42,230.0 | + 2,232.0 |
| TOTAL | $236,947.0 | $300,064.0 | $+63,117.0 |

GENERAL INVESTIGATIONS

THE FY 1988 BUDGET REQUEST FOR GENERAL INVESTIGATIONS INCLUDES FUNDS FOR 15 SURVEYS AND 9 PRECONSTRUCTION ENGINEERING AND DESIGN PROJECTS. WE HAVE FOUR NEW STARTS AS SHOWN ON THIS SLIDE.

DES PLAINES RIVER, IL (FC)
ST. JOSEPH RIVER, IN & MI (FC)
INLAND ROUTE, MI (REVIEW OF A COMPLETED PROJECT)
FORT WAYNE, IN (PED FC)

IN FY 1988, WE ARE SCHEDULED TO COMPLETE THE THREE STUDIES SHOWN HERE. THE FIRST TWO ARE FEASIBILITY STUDIES FOR FLOOD CONTROL AND THE THIRD IS A COMPREHENSIVE STUDY.

VERMILION, OH (FC)
CATTARAUGUS CREEK, NY (FC)
GENESEE RIVER, NY (COMP)

WE ALSO WILL COMPLETE ONE PRECONSTRUCTION ENGINEERING AND DESIGN PROJECT AT SHEYENNE RIVER, NORTH DAKOTA.

SHEYENNE RIVER, NORTH DAKOTA (FC)

I WOULD LIKE TO HIGHLIGHT THE STATUS OF A FEW OF OUR MAJOR GI STUDIES AND PROJECTS.

DES PLAINES RIVER, ILLINOIS

WE ARE REQUESTING FUNDS FOR A NEW START FOR A STUDY OF THE FLOOD PROBLEMS IN THE DES PLAINES RIVER, ILLINOIS. LAST SEPTEMBER, THE BASIN WAS HIT WITH A RECORD FLOOD THAT CAUSED ABOUT $35 MILLION IN DAMAGES TO ABOUT 10,000 HOMES AND 260 BUSINESSES. OVER 15,000 PEOPLE WERE EVACUATED DURING THE HIGH WATER.

SAGINAW RIVER, MICHIGAN

THE SAGINAW RIVER BASIN, MICHIGAN ALSO SUFFERED SEVERE FLOOD DAMAGES IN SEPTEMBER 1986. THE FLOODS OF RECORD OCCURRED ON THE TITTABAWASSEE AND THE CASS RIVERS. OVER 4,000 FAMILIES WERE EVACUATED AND 600,000 ACRES OF CROPS WERE DESTROYED. THE FEASIBILITY PHASE OF THIS STUDY WILL CONTINUE IN FY 88 WITH MY REPORT SCHEDULED FOR COMPLETION IN JUNE 1989.

BUFFALO METROPOLITAN AREA, NEW YORK

IN FEBRUARY 1985, THE TONAWANDA CREEK BASIN, IN THE BUFFALO METROPOLITAN AREA, SUFFERED $5 MILLION IN DAMAGES FROM FLOODING. THE BASIN CONTINUES TO EXPERIENCE RECURRING FLOODING. ICE JAM FLOODING CONTINUES TO BE ALMOST AN ANNUAL PROBLEM. THE STUDY WILL DEVELOP ALTERNATIVE PLANS TO REDUCE FUTURE DAMAGES.

FORT WAYNE METROPOLITAN AREA, INDIANA

AT FORT WAYNE, INDIANA, WE WILL COMPLETE A SURVEY REPORT ON THE FLOOD PROBLEMS THIS FISCAL YEAR. OUR FY 1988 REQUEST WILL ALLOW US TO START PRECONSTRUCTION ENGINEERING AND DESIGN FOR THIS PROJECT. IN 1982, THE SECOND WORST FLOOD ON RECORD AT FORT WAYNE CAUSED $35 MILLION IN DAMAGES. THE BENEFIT TO COST RATIO FOR THE FORT WAYNE PROJECT IS 2.7 to 1.

LITTLE CALUMET RIVER, INDIANA

THE AUTHORIZED PROJECT FOR THE LITTLE CALUMET RIVER, INDIANA INCLUDES 22 MILES OF LEVEES AND FLOODWALLS TO PROTECT PARTS OF THE COMMUNITIES OF HAMMOND, MUNSTER, HIGHLAND, GRIFFITH, AND GARY. THE PROJECT AUTHORIZED IN THE WATER RESOURCES DEVELOPMENT ACT OF 1986 DIFFERS FROM THE PLAN RECOMMENDED BY THE CHIEF OF ENGINEERS BY CALLING FOR MORE STRUCTURAL AND LESS NON-STRUCTURAL PROTECTION. WE ARE WORKING TO RESOLVE THESE DIFFERENCES.

MUSCATINE ISLAND, IOWA

THE MUSCATINE ISLAND, IOWA PROJECT WILL PROVIDE 200-YEAR FLOOD PROTECTION FROM HIGH WATER ON THE MISSISSIPPI RIVER FOR 30,700 ACRES OF VALUABLE FARM LAND AND A PORTION OF THE CITY OF MUSCATINE. THERE ARE A NUMBER OF COMMERCIAL AND INDUSTRIAL ESTABLISHMENTS AND HOMES WITHIN THE PROTECTED PORTION OF THE CITY. THE BENEFIT TO COST RATIO FOR THIS PROJECT IS 5.4 to 1.

ROOT RIVER AT HOUSTON, MINNESOTA

AT HOUSTON, MINNESOTA, A 100-YEAR FLOOD ON THE ROOT RIVER WOULD CAUSE ALMOST $15 MILLION IN DAMAGES AND REACH AN AVERAGE DEPTH OF FOUR FEET OVER MOST OF THE CITY. THE PROPOSED PROJECT AT HOUSTON HAS A BENEFIT TO COST RATIO OF 2.0 TO 1.

SHEYENNE RIVER, NORTH DAKOTA

THE SHEYENNE RIVER, NORTH DAKOTA PROJECT HAS THREE MAJOR FEATURES: LEVEES AND A DIVERSION CHANNEL AT WEST FARGO AND RIVERSIDE; A DIVERSION CHANNEL FROM HORACE TO WEST FARGO; AND A FIVE-FOOT RAISE OF THE FLOOD POOL AT BALDHILL DAM. THE RECOMMENDED PROJECT WILL PROTECT OVER 2,000 RESIDENTS AND 50,000 ACRES OF AGRICULTURAL LAND. THE BENEFIT TO COST RATIO FOR THIS PROJECT IS 7.4 TO 1. PRECONSTRUCTION ENGINEERING AND DESIGN WILL BE COMPLETED IN FY 1988.

CONSTRUCTION GENERAL

NOW A FEW WORDS ON OUR CONSTRUCTION GENERAL PROGRAM.

BETTENDORF, IOWA

IN FY 1987, WE WILL COMPLETE THE $16 MILLION BETTENDORF, IOWA FLOOD CONTROL PROJECT. WE ARE CONTINUING WITH CONSTRUCTION OF LEVEES AND FLOODWALLS. ALL WORK IS SCHEDULED FOR COMPLETION EARLY THIS SUMMER.

THE FY 88 BUDGET REQUEST INCLUDES 15 CONSTRUCTION PROJECTS. FY 88 FUNDING WILL PROVIDE FOR THE NEW CONSTRUCTION STARTS ON THREE FLOOD CONTROL PROJECTS AT RENO BEACH-HOWARD FARMS, OHIO; NORTH BRANCH CHICAGO RIVER, ILLINOIS; AND STATE ROAD AND EBNER COULEES, WISCONSIN. THESE PROJECTS WHEN COMPLETED WILL PROVIDE MUCH NEEDED REDUCTION OF FLOOD DAMAGES.

NOW, I WOULD LIKE TO SHOW YOU BRIEFLY THE STATUS OF SOME OF OUR CONTINUING CONSTRUCTION PROJECTS.

FIRST OF ALL, THE NORTH CENTRAL DIVISION HAS MADE GOOD PROGRESS ON SIX OF THE SEVEN (7) NEW CONSTRUCTION PROJECTS AS PART OF THE FY 1985 SUPPLEMENTAL APPROPRIATIONS BILL. THE LOCAL COOPERATION AND FINANCING ARRANGEMENTS FOR THESE SIX PROJECTS WERE COMPLETED ON TIME TO START ACTUAL CONSTRUCTION IN 1986. THE REMAINING PROJECT AT CLEVELAND HARBOR, OHIO HAS NOT STARTED BECAUSE NO LOCAL COOPERATION AGREEMENT WAS EXECUTED.

UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT PROGRAM

THE IMPLEMENTATION OF UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT PROGRAM WILL BE CONTINUED WITH THE FUNDS REQUESTED IN FY 1988. THE MAJOR PORTION OF THE FUNDS REQUESTED WILL BE FOR HABITAT REHABILITATION AND ENHANCEMENT PROJECTS. THE LONG TERM RESOURCE MONITORING ACTIVITIES ARE BEING DEVELOPED TO DETERMINE IF THE HABITAT PROJECTS ARE WORKING AND TO INDICATE WHETHER THE RIVER SYSTEM IS REGAINING ITS LOST HABITAT OR IF DEGRADATION IS CONTINUING. OVER 25 PERCENT OF THE REQUESTED FUNDS ($1,101,000) ARE FOR A HABITAT REHABILITATION AND ENHANCEMENT PROJECT AT DRESSER ISLAND, MISSOURI (ST. LOUIS DISTRICT). ($1.4 M FOR LONG TERM RESOURCE MONITORING AND $2.5 M FOR HABITAT PROJECTS).

ELLICOTT CREEK, NEW YORK

THE CONTRACT WAS AWARDED FOR THE ELLICOTT CREEK, NEW YORK PROJECT ON 15 AUGUST 1986, AND CONSTRUCTION INITIATED LATER THAT MONTH. IN FY 88, WE WILL CONTINUE CHANNEL AND RELOCATION CONSTRUCTION IN THE PROJECT. THE WORK IS 11 PERCENT COMPLETE. WE WILL COMPLETE THE ENTIRE PROJECT IN SEPTEMBER 1989.

BASSETT CREEK, MINNESOTA

THE FUNDS REQUESTED FOR BASSETT CREEK, MINNESOTA WILL BE USED TO INITIATE CONSTRUCTION OF THE SECOND PHASE OF THE UPSTREAM IMPROVEMENTS AND COMPLETE THE FIRST PHASE OF THE TUNNEL CONSTRUCTION. THIS PROJECT, WHEN COMPLETED, WILL PROVIDE FLOOD PROTECTION TO 222 HOMES AND 18 INDUSTRIES LOCATED IN THE FLOOD PLAIN AND NUMEROUS COMMERCIAL AND INDUSTRIAL DEVELOPMENTS IN THE MINNEAPOLIS AREA.

LAKE DARLING, SOURIS RIVER, NORTH DAKOTA

THE LAKE DARLING, SOURIS RIVER, NORTH DAKOTA, PROJECT IS BEING MODIFIED TO BE CONSISTENT WITH THE NEW AUTHORIZATION CONTAINED IN THE WATER RESOURCES DEVELOPMENT ACT OF 1986. THE SENATE REPORT 99-441, ON THE FY 87 APPROPRIATIONS, REQUESTED THAT OUR PROJECT PLAN BE REPORTED TO THE COMMITTEE DURING THESE HEARINGS.

MAJOR PROJECT FEATURES INCLUDE THE PURCHASE OF FLOOD STORAGE IN THE PROPOSED RAFFERTY AND ALAMEDA RESERVOIRS IN SASKATCHEWAN, CANADA; THE MODIFICATION OF THE GATED OUTLETS AT LAKE DARLING DAM; THE CONSTRUCTION OF LEVEES AT SAWYER, VELVA AND LEVEE IMPROVEMENTS FOR SIX SUBDIVISIONS BETWEEN BURLINGTON AND MINOT AND THE EXISTING IMPROVED CHANNEL AT MINOT, NORTH DAKOTA. OTHER ITEMS INCLUDE FLOOD PROOFING, RELOCATION, OR ACQUISITION OF RURAL RESIDENCES DOWNSTREAM OF LAKE DARLING DAM AND THE PURCHASE OF FLOWAGE EASEMENTS; MODIFICATIONS TO AND DAM SAFETY FOR U.S. FISH AND WILDLIFE STRUCTURES IN THE UPPER SOURIS AND J. CLARK SALYER NATIONAL WILDLIFE REFUGES. WE WILL ALSO INCLUDE COMPENSATION TO

MANITOBA, CANADA, FOR ALTERED RETURN FLOWS AND A DOWNSTREAM FLOOD WARNING SYSTEM.

THE FUNDS IN FY 1988 WILL CONTINUE CONSTRUCTION OF THE LEVEE IMPROVEMENTS FOR THE SIX SUBDIVISIONS BETWEEN BURLINGTON AND MINOT; INITIATE CONSTRUCTION OF THE SAWYER LEVEE IMPROVEMENTS, THE DOWNSTREAM RURAL IMPROVEMENTS, AND THE REFUGE STRUCTURE MODIFICATIONS; AND WILL PROVIDE PARTIAL PAYMENT TO CANADA TO MEET THE PROVINCE OF SASKATCHEWAN'S CONSTRUCTION AND PAYMENT SCHEDULE. FUNDS WILL ALSO BE USED FOR CONTINUED ENGINEERING AND DESIGN WORK. THE SUCCESS OF THE PROJECT IS DEPENDENT UPON THE UNITED STATES' COMMITMENT OF FUNDS TO MEET SASKATCHEWAN'S SCHEDULE. WHEN COMPLETED, THE PROJECT WILL PROVIDE 100-YEAR FLOOD PROTECTION AT MINOT, NORTH DAKOTA.

MANKATO AND NORTH MANKATO, MINNESOTA

THE MANKATO AND NORTH MANKATO PROJECT, IN MINNESOTA, IS 81 PERCENT COMPLETE AS COMPARED TO 69 PERCENT LAST YEAR. THE MAIN STREET BRIDGE WAS COMPLETED AND OPENED TO TRAFFIC ON NOVEMBER 11, 1986. THE REQUESTED FUNDS IN FY 1988 WILL BE FOR CONSTRUCTION OF THE HIGHWAY 169 BRIDGE OVER THE BLUE EARTH RIVER AND FOR COMPLETION OF THE RAILROAD BRIDGES BETWEEN LE HILLIER AND MANKATO.

OUR FY 88 O&M PROGRAM SUMMARY IS SHOWN ON THIS SLIDE.

### OPERATION AND MAINTENANCE
### ($000)

| | FY 1987 ALLOCATIONS | FY 1988 REQUEST | INCREASE OR DECREASE |
|---|---|---|---|
| 1. NAVIGATION | | | |
| A. CHANNELS & HARBORS | | | |
| (1) CHANNELS & HARBORS REGULAR | $ 59,687.0 | $ 80,263.0 | $+20,576.0 |
| (2) DIKED DISPOSAL | 3,390.0 | 13,745.0 | +10,355.0 |
| B. LOCKS, DAMS & CANALS | 64,227.0 | 71,665.0 | + 7,438.0 |
| C. MAJOR REHAB | 39,998.0 | 42,230.0 | + 2,232.0 |
| TOTAL NAVIGATION | $167,302.0 | $207,903.0 | $+40,601.0 |
| 2. FLOOD CONTROL | 13,355.0 | 14,658.0 | + 1,303.0 |
| 3. MULTIPLE PURPOSE PROJECTS INCLUDING POWER | 9,968.0 | 9,474.0 | - 494.0 |
| 4. PROTECTION OF NAVIGATION | 7,050.0 | 7,991.0 | + 941.0 |
| TOTAL | $197,675.0 | $240,026.0 | $+42,351.0 |

THE $42 MILLION INCREASE IN FY 88 IS DUE TO THE MAJOR REHABILITATION AND DIKED DISPOSAL PROGRAMS, AND MAJOR MAINTENANCE PROJECTS.

MAJOR REHABILITATIONS

NORTH CENTRAL DIVISION HAS MANY NAVIGATION STRUCTURES OVER 50 YEARS OLD AND MANY REQUIRE MAJOR REHABILITATION TO ASSURE THEIR CONTINUED SERVICE. THIS BUDGET YEAR WE HAVE NINE CONTINUING MAJOR REHABS UNDERWAY. INCLUDED ARE: REPAIR OF PIER AND BREAKWATER STRUCTURES AT MILWAUKEE HARBOR, WISCONSIN; FOUR PROJECTS ON THE ILLINOIS WATERWAY AT BRANDON ROAD, LAGRANGE, PEORIA, AND MARSEILLES LOCKS AND DAMS; AND FOUR PROJECTS ON THE MISSISSIPPI RIVER; THE FIRST AT LOCKS AND DAMS 3 & 5A TO 9; THE OTHERS ARE AT LOCKS AND DAMS 20, 21 AND 22. THE MAJOR REHAB WORK AT THE LOCK SITES CONSISTS OF REPLACEMENT OF TAINTER GATES, LOCK MACHINERY AND RESURFACING OF DETERIORATED CONCRETE SURFACES. IN

ADDITION TO THE NINE CONTINUING PROJECTS, WE WILL ALSO INITIATE THE REHABILITATION OF THE BREAKWATER AT CALUMET HARBOR, ILLINOIS AND INDIANA. (THIS IS THE ONLY MAJOR REHAB NEW START IN THE NATION).

DIKED DISPOSAL PROGRAM

THERE CONTINUES TO BE A NEED FOR CONFINING POLLUTED DREDGED MATERIAL IN ORDER TO MAINTAIN SOME OF OUR GREAT LAKES NAVIGATION PROJECTS. THE FY 88 BUDGET REQUEST INCLUDES ALMOST $14 MILLION IN THE DIKED DISPOSAL PROGRAM (PL 91-611) TO CONTINUE CONSTRUCTION OF THREE DISPOSAL FACILITIES (CLINTON AND SAGINAW RIVERS, MI; GREEN BAY HARBOR, WI), AND COMPLETE THE KEWEENAW WATERWAY, MICHIGAN PROJECT. IN THE FUTURE, ADDITIONAL DISPOSAL FACILITIES THAT ARE NEEDED WILL BE CONSTRUCTED UNDER REGULAR PROJECT AUTHORITIES.

THE FY 88 O&M PROGRAM WILL PROVIDE SUFFICIENT FUNDS TO OPERATE AND MAINTAIN THE GREAT LAKES AND UPPER MISSISSIPPI RIVER NAVIGATION SYSTEMS WHICH SERVE THE NEEDS OF COMMERCIAL NAVIGATION AND SUPPORT THE ECONOMIC GROWTH OF THE NATION.

RECORD FLOODING

IN 1986, RECORD FLOODING OCCURRED AT SEVERAL LOCATIONS IN THE NORTH CENTRAL DIVISION DUE TO EXTREMELY HEAVY SEPTEMBER RAINS. AS I PREVIOUSLY STATED, THE DES PLAINES RIVER BASIN IN ILLINOIS WAS HIT WITH A FLOOD OF RECORD AT GURNEE, DES PLAINES, RIVERSIDE AND OTHER ILLINOIS COMMUNITIES WITH DAMAGES OVER $35 MILLION DOLLARS.

THE SAGINAW RIVER BASIN FLOODING I PREVIOUSLY MENTIONED WAS PART OF A RECORD FLOOD EVENT THROUGH THE MIDSECTION OF THE LOWER PENINSULA OF MICHIGAN THAT AFFECTED 28 COUNTIES. RAINFALL AMOUNTS OF 8 TO 13 INCHES OCCURRED IN THE AREA OVER A 48 HOUR PERIOD. TOTAL DAMAGES APPROACHING $400 MILLION HAVE BEEN ESTIMATED BY THE STATE FOR THIS EVENT, OF WHICH $275 MILLION OCCURRED IN THE SAGINAW RIVER BASIN.

DURING THIS SAME PERIOD, HEAVY RAINS AND FLOODING OCCURRED ALONG THE UPPER MISSISSIPPI RIVER AND ITS TRIBUTARIES. NUMEROUS COMMUNITIES WERE FLOODED THROUGHOUT THE REGION.

## HIGH WATER LEVELS

THE GREAT LAKES, IN PARTICULAR LAKES MICHIGAN-HURON, ST. CLAIR AND ERIE HAVE SET ALL TIME RECORDS FOR HIGH WATER LEVELS. THE LEVELS ARE ALREADY THE HIGHEST THEY HAVE BEEN IN THIS CENTURY AND IT APPEARS THEY WILL GO STILL HIGHER DURING THE EARLY PART OF 1987. LAKES MICHIGAN-HURON AND ST. CLAIR ESTABLISHED A COMPLETE NEW SET OF MONTHLY RECORD HIGH WATER LEVELS IN 1986. FORTY-THREE OUT OF A POSSIBLE SIXTY MONTHLY RECORDS WERE BROKEN IN 1986. WHILE LAKE ONTARIO HAS NOT SET RECORDS, THE RELEASES IN THE ST. LAWRENCE RIVER FOR THE LAST YEAR HAVE BEEN AT RECORD FLOWS.

THE UNPRECEDENTED HIGH LAKE LEVELS ARE THE RESULT OF ABOVE NORMAL PRECIPITATION ON THE GREAT LAKES BASIN IN 13 OUT OF THE PAST 15 YEARS. THIS EFFECT HAS BEEN COMPOUNDED BY THE LOWER THAN NORMAL EVAPORATION RATES DUE TO COOLER AIR TEMPERATURES OVER THE LAKES.

EXTREME HARDSHIP HAS BEEN CAUSED TO THE SHORELINE PROPERTY OWNERS BY THE FLOODING AND EROSION RESULTING FROM THE COMBINATION OF THESE RECORD HIGH LEVELS AND STORM EVENTS. FORTUNATELY, THERE WERE FEW MAJOR STORMS IN THE BASIN, DURING THIS PERIOD, OR THE DAMAGES COULD HAVE BEEN MUCH HIGHER.

## EMERGENCY ADVANCE MEASURES ON THE GREAT LAKES

DUE TO THE CONTINUING HIGH WATER LEVELS ON THE GREAT LAKES, THE CORPS OF ENGINEERS INITIATED AN "ADVANCE MEASURES" PROGRAM, UNDER PL 84-99 AUTHORITY, TO HELP REDUCE DAMAGES FROM THIS UNUSUAL FLOOD THREAT. DURING 1985 AND 1986, MICHIGAN, OHIO, ILLINOIS, MINNESOTA, WISCONSIN, AND NEW YORK REQUESTED ASSISTANCE UNDER THIS PROGRAM. TWELVE PROJECTS HAVE BEEN COMPLETED OR ARE UNDERWAY, AS SHOWN ON THIS SLIDE. THESE PROJECTS ARE BEING COST SHARED AT 70% FEDERAL AND 30% NON-FEDERAL.

| STATE | NO OF PROJECTS<br>COMPLETED | <br>UNDERWAY | $ MILLIONS |
|---|---|---|---|
| MICHIGAN | 6 | 2 | $ 7.9 |
| OHIO | 2 | 1 | 0.6 |
| ILLINOIS | - | 1 | 1.4 |
| TOTAL | 8 | 4 | $ 9.9 |

IN ADDITION TO THE ADVANCE MEASURES PROGRAM, IN OCTOBER 1986, MR. ROBERT DAWSON, THE ASSISTANT SECRETARY OF THE ARMY FOR CIVIL WORKS, APPROVED A NEW "SELF-HELP" PROGRAM FOR THE GREAT LAKES STATES. THIS PROGRAM INCLUDES DISTRIBUTION, AT FULL FEDERAL COST, OF SANDBAGS, SAND, AND PLASTIC SHEETING, AS SHOWN HERE, TO ENABLE THE AFFECTED COMMUNITIES TO PROVIDE FLOOD PROTECTION. THE ESTIMATED COST FOR THE SELF HELP PROGRAM IS $6.1 MILLION

DISTRIBUTION

| | |
|---|---|
| SANDBAGS | 4.6 MILLION |
| SAND | 36,000 TONS |
| SHEETING | 1,300 ROLLS |

WE CONTINUE TO PROVIDE CONSIDERABLE SUPPORT TO THE INTERNATIONAL JOINT COMMISSION (IJC) RELATING TO THE U.S.-CANADIAN BOUNDARY WATERS WITHIN OUR AREA. IN PARTICULAR, WE HAVE BEEN VERY BUSY IN SUPPORTING THE IJC BOARDS DEALING WITH THE GREAT LAKES RECORD HIGH WATER LEVELS. WE STAND READY TO PROVIDE ASSISTANCE TO THE IJC, ESPECIALLY AS RELATED TO THE NEW STUDY REQUESTED BY THE GOVERNMENTS ON GREAT LAKES RECORD HIGH WATER LEVELS.

## CONCLUSION

AS ALWAYS, I AM PROUD OF THE MEN AND WOMEN OF THE NORTH CENTRAL DIVISION. THEY STAND READY TO PROVIDE DEDICATED SERVICE TO THE PEOPLE OF THE REGION. WE LOOK FORWARD TO MEETING THE CHALLENGES OF WATER RESOURCES DEVELOPMENT IN OUR AREA IN FISCAL YEAR 1988.

MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE, THIS CONCLUDES MY STATUS REPORT AND I WOULD BE PLEASED TO ANSWER ANY QUESTIONS YOU MAY HAVE.

THANK YOU.

## UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT PROGRAM

Senator JOHNSTON. Thank you very much, General Pratt.

The Corps is just getting underway with a $200 million environmental program on the upper Mississippi River. What are we mitigating there, and what does the Corps plan to accomplish with the $200 million?

General PRATT. Sir, I am not sure the word "mitigating" is exactly a good word to use in this case. What we are attempting to do is maintain the river as a multiuse river for navigation, fish and wildlife, and recreation.

What we are basically doing in this area is undertaking a series of rehabilitation and new projects involving habitats to make sure that the habitats continue to be viable places for wildlife and plantlife to grow to support fish and wildlife.

Senator JOHNSTON. That is not because of anything the Corps has done.

General PRATT. It may be because of some of the things the Corps has done in the past or the way the river has changed due to the fact that we put a series of locks and dams on the river. It is also due to some of the impacts of sedimentation from agricultural and urban runoff in the drainage area and things of that nature. So it is a combination of things, not necessarily one or the other, causing the greatest amount of problems.

In addition, we are implementing a significant monitoring program that will evaluate the impact of rehabilitation projects on the waterway system. Then we will know that we are doing the right thing to make sure that the river continues to be a multiuse river.

### FUTURE FUNDING LEVELS

Senator JOHNSTON. What level of funding do you anticipate over the next 5 years? Provide for the record a funding profile through completion.

General PRATT. Yes, sir; I will be glad to submit the information for the record for the Upper Mississippi River system environmental management program. We refer to the project as UMRS–EMP for short.

[The information follows:]

### UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT PROGRAM FUNDING SCHEDULE

The current program for the Upper Mississippi River System Environmental Management Program [UMRS–EMP] for fiscal years 1988–92 is as follows:

[In thousands of dollars]

| Element | Fiscal year— 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Habitat rehabilitation and enhancement projects | $2,493 | $3,260 | $3,350 | $3,350 | $3,350 |
| Long-term resource monitoring (including computerized inventory and analysis) | 1,400 | 1,500 | 1,500 | 1,500 | 1,500 |
| Recreation projects | | | | | |
| Recreation economics | | | | | |
| Traffic monitoring | 30 | 50 | 50 | 50 | 50 |
| Program management | 245 | 190 | 100 | 100 | 100 |
| Total | 4,168 | 5,000 | 5,000 | 5,000 | 5,000 |

The above amounts are based on an assumption that approximate fiscal year 1988 program levels will continue until currently unscheduled habitat projects are programmed and additional justification is developed for expanding efforts in long-term resource monitoring.

We are presently engaged in an intensive effort to schedule more projects for engineering and design and construction, and to develop more detailed work plans for resource monitoring. We expect to significantly increase our capability for fiscal year 1989 and the out-years.

Our management system for the UMRS–UMP includes the preparation of an annual addendum to the general plan for the UMRS–UMP in the spring of each year. The purpose of the annual addendum is to develop a maximum schedule of work, in consultation with the US FWS and the Upper Mississippi River Basin Association, for the next budget cycle (fiscal year 1989) and to revise and update the scheduled program for the current year (fiscal year 1987) and the following year (fiscal year 1988) in accordance with the President's budget. The first annual addendum, completed in May 1986, scheduled a total level of funding averaging approximately $21 million annually over fiscal years 1993–96. Work has recently started on the second annual addendum, scheduled for completion in May 1988. The second annual addendum will reexamine the funding profile for completion, now scheduled for fiscal year 1997 as a result of the enactment of Public Law 99–662.

Senator JOHNSTON. What is the Corps policy regarding the funding for individual items? Are you undertaking only activities that can be completed within the budget year or are activities being started with multiyear commitments?

General PRATT. Mr. Chairman, to promote management efficiencies, we are encouraging the completion of engineering and design and construction of habitat projects in 1-year increments. There is no policy that activities must be completed within the budget year. We expect some of the larger habitat projects now being formulated will require multiyear commitments, and this is certainly true for long-term resource monitoring.

### RELATIONSHIP TO LOCKS AND DAM 26

Senator JOHNSTON. How much of that plan is directly related to lock and dam 26? Is there much of it that is related to lock and dam 26?

General PRATT. No, sir; not directly. The environmental management program is independent of lock and dam 26. The program covers the entire river all the way to Minnesota, so the operation is over a five-state area, and we are working throughout the pools up the entire length of the river system.

Senator JOHNSTON. Could you provide for the record a breakout of the average annual benefits by project purposes for this project?

General PRATT. Sir, the UMRS–EMP is primarily a program of environmental rehabilitation and enhancement. Approximately 95 percent of authorized and scheduled costs would be for habitat projects or resource monitoring. While these activities do not lend themselves to conventional benefit-cost analysis, we believe there will be an overall positive impact.

Senator JOHNSTON. How much nonfederal cost sharing is anticipated on this $200 million effort and how does that compare with the general policy established in Public Law 99–662?

General PRATT. Mr. Chairman, the UMRS–EMP is being cost shared in accordance with Public Law 99–662. Habitat rehabilitation and enhancement projects are being cost shared under section 906(e) which requires 25 percent nonfederal cost sharing except when the enhancement is in an area managed as a national wildlife refuge. The program of habitat projects is evolutionary in nature; however, a projection based on river-miles of refuge lands in comparison to total river-miles of available habitat area indicates nonfederal costs of $2,163,000. Any recreation projects that are undertaken will require 50 percent nonfederal cost sharing.

## PRESQUE ISLE PENINSULA, ERIE, PA.

Senator JOHNSTON. Please discuss the newly authorized Presque Isle Peninsula project in Pennsylvania as it relates to administration policy regarding beach erosion projects and recreational benefits.

General PRATT. Mr. Chairman, because of administration concern relating to beach erosion projects having 50 percent of their benefits attributable to recreation, the Assistant Secretary of the Army for Civil Works directed that the scope of the Presque Isle project be reduced, and funds adjusted accordingly, to focus on the construction required to reduce existing federal operation and maintenance costs for Erie Harbor. Reformulation studies conducted during the period of 1983 through 1985 were an attempt to reassess the Presque Isle project and develop a construction program for the plan of improvement that sought to be consistent with administration policy guidance.

Senator JOHNSTON. Is this the type project that the administration would support in the budget if all cost-sharing provisions were complied with?

General PRATT. We, of course, Mr. Chairman, hope that our reformulation studies, which emphasize a project resulting in reduced harbor maintenance dredging costs and substantially reduce the need for replenishing the beach with sand, will indeed be supported in the budget process. I hasten to add, however, that the acid test of review for new construction starts has not yet been passed. We all have to understand that, while the representation and focus of the project in the reformulation study have changed, the physical plan—that is, 58 breakwaters—remains the same as when the Office of Management and Budget first reviewed it.

## SHEYENNE RIVER, N. DAK.

Senator JOHNSTON. Now, I would like to defer to my distinguished colleague, the chairman of the Environment and Public Works Committee, Senator Burdick.

Senator BURDICK. Welcome to the committee, General Pratt.

General PRATT. Thank you, sir.

Senator BURDICK. And welcome to your staff. I enjoyed the show. It was very interesting and informative.

I am talking now about the Sheyenne River flood control project that has been referred to. This project was authorized in Public Law 99-662, last year's water resources bill. In addition to the project described in the report of the Chief of Engineers, which is cited in the law, the legislation also provides for the construction of a dam and reservoir of approximately 35,000 acre-feet of storage for flood protection on the Maple River.

Do you have an estimate of the time and funds required to complete the engineering plans on this reservoir?

General PRATT. Sir, I do not have a detailed number I can give you right now.

We understand that we have to do an evaluation report for the Maple River portion of the project. We are much further along in our engineering of the other portions of the project.

Senator BURDICK. Can you give me an idea of when this might be completed?

General PRATT. We can complete the evaluation report for that in 2 years, sir. If found feasible, engineering and design will require additional time.

Senator BURDICK. Am I correct in my assumption that a full feasibility report is not necessary for this element of the project?

General PRATT. You are correct, sir.

Senator BURDICK. Does the North Central Division have the capability to begin work on the engineering plans in fiscal year 1988 if funds were available?

General PRATT. Sir, we could start our evaluation report process. Engineering plans would follow after the completion of the evaluation report.

Senator BURDICK. Is it your intent to implement the Maple River Reservoir concurrently with the rest of the project?

General PRATT. As it stands right now, sir, to do that, if you really mean concurrently, we would have to slow down the rest of the project. However, I think if it proves feasible to do the Maple River portion, we would probably prefer to implement the Maple River portion after we have already started construction on some of the other work on the Sheyenne River, because we are further along on that.

Senator BURDICK. If going in tandem is going to delay it, I think we probably prefer to go ahead with what we have ready.

General PRATT. Yes, sir; so would we.

Senator BURDICK. Hoping that the other horse would not be too far behind, though.

General PRATT. Yes, sir; I understand.

## DEVILS LAKE, N. DAK.

Senator BURDICK. What is the current status of the outlet at Devils Lake? Can you give me any assessment of the likelihood that an economically viable project can be found?

General PRATT. We should complete the feasibility for that study with our fiscal year 1987 monies, sir. It looks now like there will be an economically feasible outlet at Devils Lake.

There are still some problems from an environmental standpoint because of the salinity of the flow. We have not pinned down exactly how we are going to deal with that. In one situation, you get a lot of salinity in the water, and the best solution may not be the one that is most economically justified. So we have not worked that out yet.

But I do believe there is an economic solution to that problem of Devils Lake if it continues to rise.

Senator BURDICK. Have we alleviated the fears of our neighbors to the north about this project?

General PRATT. Not completely, sir. That is one of the environmental issues we still must work out. They are concerned about that.

Senator BURDICK. When I say neighbors, I am referring to Canada.

General PRATT. Yes, sir; that is what I mean, because if the flow goes into the Sheyenne River, of course it ends up flowing back into Canada.

Senator BURDICK. They have had some question about that. I do not know how sincere they are. Do you think the environmental objections they might have can be overcome?

General PRATT. It is possible, sir. Normally, the high saline content of the water occurs when you have lower amounts of water and lower flow. You would only have to divert the outlet flow from Devils Lake when you have higher flows, during wet periods. So I think they can be worked out, but we have not worked them out completely yet.

## RAFFERTY AND ALAMEDA DAMS

Senator BURDICK. Now let's spend a little time on Rafferty and Alameda. What is the current status of negotiations with the Canadian government on the Rafferty and Alameda Dams?

General PRATT. Sir, we have a meeting with the province representatives on March 10 and 11 to discuss technical matters, which I hope will include the operating plan and maintenance of the structures, and funding for the scheduled construction.

If we have no further complications, I feel that we will be able to provide input to the Department of the Army and the State Department so they can conduct the formal negotiations with Canada.

You understand that my St. Paul District is just handling the technical discussions with the Canadians.

Senator BURDICK. Of course, these negotiations have been going on for some time now. I have been told that most all of the problems have been resolved with just a few technical problems remaining; is that correct?

General PRATT. Sir, we are very close. Most of the major problems have been resolved. As you well know, there were many major problems. Solution to most of them have been brought pretty close to fruition. So I hope this meeting will wrap it up. I have said that before, too, sir.

Senator BURDICK. Are we close enough to tell the Appropriations Committee we are ready to go?

General PRATT. We have funds in our fiscal year 1988 request for construction, sir. We think we are getting close enough. We are ready to do that; we are ready to support that operation.

Senator BURDICK. I want to tell the chairman that this is a very unusual project. As planned, it is going to work between two sovereign nations.

Senator JOHNSTON. Those are the two dams we will help build up in Canada?

Senator BURDICK. That is correct.

### FISCAL YEAR 1988 FUNDING

How much money is included in your 1988 budget request for the Rafferty and Alameda projects?

General PRATT. Of our $14.8 million request, sir, $8.8 million is for the two Canadian dams.

Senator BURDICK. I do not know whether it is too early or not, but do you have a time table for the construction?

General PRATT. Sir, we have not received a detailed time table from the Canadians yet. That is what we hope to pin down in this meeting on March 9, 10, and 11 so we can see exactly what they are talking about.

Senator BURDICK. What is the Corps' interpretation of section 902 of Public Law 99–662 regarding the cost of these projects? Specifically, how does the Corps interpret the section as it applies to inflation and the exchange rates?

General PRATT. Sir, I have been informally advised by the Army counsel that the inflation section of section 902 does not apply to the $41 million U.S. share that was spelled out in the new authorization act.

Senator BURDICK. It strikes me that these projects are rather unique. Has the Corps ever participated in this type of civil works project with either the Canadian or Mexican governments in past years?

General PRATT. Sir, we have on certain type projects. The Saint Lawrence Seaway was constructed in conjunction with the Canadian government back in the 1950's. I do know that on the Rio Grande River there has been some construction between Mexico and the United States. And if I am not mistaken, for the Libby Dam in Idaho, there was cooperation between Canada and the United States.

However, I believe most of those cases were not exactly the same as the projects we are talking about here, where we are purchasing storage in a dam in Canada. I am not sure of any other location where we have done that. It may exist, but I am not aware of it.

### PAYMENT TO CANADA

Senator BURDICK. As you know, the Canadians would like to have the U.S. share up front. You understand that?

General PRATT. Yes, sir; I understand that.

Senator BURDICK. I do not know if you call it "pay as you go"; is there any possibility of giving them assurance that if we get the appropriation and not necessarily the money and we can advance them money as the work continues? Is there any possibility of doing something like that?

General PRATT. Sir, we are working very hard to do it that way. We think that is the best way to do it. We think it is the only way we can make sure that we are completely involved in the process, and in the long run it will work out best for the Corps and for the United States.

Senator BURDICK. If you know anything about the Premier up there, he gets a little nervous.

General PRATT. Yes, sir.

Senator BURDICK. He would like to know that the money is in the bank. I do not mean to appropriate the money right now, but I mean if you get an appropriation and it can be meted out as construction continues, that would be very helpful in solving our problem with him. Is that possible?

General PRATT. Once we are given their detailed construction schedule, we plan to program money so that they have those needs met and they are assured that they will have money to support their construction schedule.

Senator BURDICK. I am sure he will like to hear that.

In your statement you say, referring to the joint project with Canada, "The success of the project is dependent upon the U.S. commitment of funds to meet Saskatchewan's schedule. When completed, the project will provide a 100-year flood protection for Minot, N. Dak."

This is more or less what we have been talking about.

General PRATT. Yes, sir.

Senator BURDICK. General Pratt, do you have available the information as to what that schedule might be at this time?

General PRATT. Sir, I do not.

Senator BURDICK. Will you inform the committee and/or me when you have that schedule?

General PRATT. Yes, sir; I will.

Senator BURDICK. I want to be able to tell the Premier on the telephone that we are doing something.

General PRATT. Yes, sir. I owe you that schedule, sir, to you and the committee.

Senator BURDICK. Thank you.

### SUBMITTED QUESTIONS

[NOTE: The following questions were not asked at the hearing but were submitted to the Corps for response for the record:]

### RAFFERTY AND ALAMEDA DAMS, CANADA

Senator JOHNSTON. Has Canada provided a firm construction schedule for the project? If they have, could you provide a copy for the record?

General PRATT. Sir, Canadian representatives have indicated they will be providing a firm construction schedule at a meeting now scheduled for March 10 and 11, 1987, in Estevan, Saskatchewan. A copy of the construction schedule could be provided for the committee following that meeting.

Senator JOHNSTON. How likely is it that construction can begin in fiscal year 1988? Is all Canadian approval and review of the Rafferty and Alameda project complete? If not, could you give the committee an idea of the steps and timeframe that will be needed to get the project to the point of construction?

General PRATT. Mr. Chairman, Canadian representatives have indicated they plan to initiate construction of Rafferty Dam in the spring of 1988, and could have both Rafferty and Alameda Dam constructed as early as 1990. However, initiation of construction is subject to having U.S. funds in place and reaching a technical agreement on an operating plan and project-related technical matters between affected agencies. A meeting is scheduled with Provincial members on March 10 and 11, 1987, to discuss technical matters such as construction schedules and the operating plan and proposed funding. If no further complications develop, all technical considerations could be finalized in a technical agreement in the next several months. With this agreement and U.S. funding in place, initiation of construction could follow in the second half of fiscal year 1988.

### ADDITIONAL QUESTIONS SUBMITTED FOR THE RECORD

Senator JOHNSTON. General Pratt, as I mentioned, I have several other questions prepared by the staff for your response, and Senator Specter has submitted some questions as well.

[The following questions were not asked at the hearing but were submitted to the Corps for response for the record:]

### ADDITIONAL QUESTIONS SUBMITTED BY SENATOR JOHNSTON

### RENO BEACH-HOWARD FARMS, OHIO

Senator JOHNSTON. Tell the committee about the Reno Beach-Howard Farms project in Ohio which is a new construction start for fiscal year 1988.

General PRATT. Sir, this project is located on the Lake Erie shoreline about 15 miles east of Toledo. The authorization provided for construction of a roadway seawall 8,200 feet in length and a 230-foot steel sheet pile floodwall connecting the eastern end of the seawall at Wards Canal to the existing inland dike paralleling the canal. However, in 1973, temporary dikes 15,400 feet in length were constructed under the Operation Foresight program. These dikes are now considered the existing condition, and the present plan calls for 7,900 feet of dike reconstruction and 5,300 feet of dike repair.

Senator JOHNSTON. The justification material does not indicate that there is positive or firm assurance by local interests to cost share on this project, yet the administration has included the project in the fiscal year 1988 budget. Please explain this.

General PRATT. Sir, if there is a good indication that the local interests are willing to cost share, and the execution of the local cooperation agreement will occur prior to the budget year, we would recommend the project for start of construction.

Senator JOHNSTON. What indication of firm commitment to cost sharing does the Corps have on this project?

General PRATT. Senator, although formal assurances have not been requested, both the Lake Erie and Howard Farms Conservancy Districts have indicated their willingness to comply with the requirements of local cooperation several times over the past 10 years. The most recent expression was in June 1986.

Senator JOHNSTON. What is the schedule for signing a binding local cooperation agreement?

General PRATT. The local cooperation agreement is expected to be executed in the third quarter of this fiscal year.

Senator JOHNSTON. What is your assessment of the local sponsors ability to cost sharing on the project?

General PRATT. Mr. Chairman, local interests have indicated a willingness to participate in and have the ability to finance the flood control project. The Lake Erie and Howard Farms Conservancy Districts are legally empowered to tax and to participate in the cost sharing for this project. It is our understanding also that the conservancy districts and the Ohio State Department of Natural Resources have an agreement to provide mutual financial support, if necessary, for the project.

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## QUESTIONS SUBMITTED BY SENATOR SPECTER

### PRESQUE ISLE PENINSULA, ERIE, PA.

Senator SPECTER. In 1986 the Congress authorized $34.8 million to construct 58 breakwalls as a permanent solution to the sand erosion problem at Presque Isle. In lieu of a permanent solution, $1.25 million has been spent annually to temporarily alleviate this perennial problem through sand nourishment. To date, $13,731,000 in federal and $5,880,000 in nonfederal funds have been spent on this temporary measure. The Army Corps of Engineers has included $1.25 million in its fiscal year 1988 budget for the sand nourishment program while it has not budgeted funds for this project. This is in contrast to the Water Resources Development Act of 1986 authorizing the breakwalls. Would you explain the reasoning behind not budgeting funds for the breakwalls?

*Answer.* The Presque Isle Peninsula at Erie, Pa., was not proposed as a new start construction project because recreation and beach erosion projects continue to carry a low budget priority.

Senator SPECTER. Does the Army Corps of Engineers have information at its disposal that Congress did not have in 1986 when it thought it appropriate to authorize the breakwalls?

*Answer.* Yes, sir; the phase II general design memorandum, which is a detailed design, was prepared in April 1986. The report recommends construction of the project plan consisting of the 58 offshore breakwaters over a 12-year staged construction period. Although the project outputs provide recreational opportunities, shoreline erosion control and storm damage reduction and reduction in dredging for commercial navigation were developed in our reanalysis.

Senator SPECTER. Are there other permanent solutions which the Corps has to offer instead of the breakwalls?

*Answer.* Yes; there are, but no other permanent solutions for shoreline protection and storm damage reduction are as economically or environmentally feasible as the 58 breakwater plan over a 12-year construction period.

### GREAT LAKES WATER LEVELS

Senator SPECTER. In the Urgent Supplemental Appropriations Act of 1986, Congress directed the Army Corps of Engineers to develop emergency contingency plans to prevent or control the Great Lakes flooding. Does the Army Corps of Engineers have any recommendations of new contingency plans, projects, or additional emergency initiatives? When do you anticipate that such emergency and comprehensive recommendations will be offered?

*Answer.* The Corps of Engineers transmitted a report to Congress in November 1986 in response to the Urgent Supplemental Appropriations Act of 1986. The report concluded that for the short term, the existing contingency plans were adequate and recommended that the Great Lakes states continue to execute these plans with the Corps supplementing their efforts through our emergency authorities. Therefore, no additional or new contingency plans were developed, and no recommendations were made for new projects or for additional expenditures beyond currently approved and funded activities. Prior to completion of the report, water levels on the Great Lakes increased over one-half foot. This significant rise occurred during the latter part of September.

In October 1986, Mr. Robert K. Dawson, the Assistant Secretary of the Army for Civil Works, approved a self-help advance measures program for the Great Lakes states. The program includes distribution of sandbags, sand, and plastic sheeting to enable the affected communities to provide flood protection.

For the medium and long term, the governments of the United States and Canada have adopted a reference pursuant to the Boundary Waters Treaty of 1909 calling for a study of appropriate methods to alleviate the adverse consequences of fluctuating water levels.

## SUBCOMMITTEE RECESS

Senator JOHNSTON. Thank you very much, General Pratt. We are very glad to have you before the committee and look forward to having you again.

General PRATT. Thank you, sir.

Senator JOHNSTON. The committee will stand in recess until Tuesday, March 3, at 10 a.m.

Whereupon, at 3:55 p.m. Thursday, February 26, the subcommittee was recessed to reconvene at 2 p.m. March 3.]

# ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 1988

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TUESDAY, MARCH 3, 1987

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
*Washington, DC.*

The subcommittee met at 10 a.m. in room SD–192, Dirksen Senate Office Building, Hon. J. Bennett Johnston (chairman) presiding.

Present: Senator Johnston.

## DEPARTMENT OF THE ARMY—CIVIL

### CORPS OF ENGINEERS—CIVIL

### LOWER MISSISSIPPI VALLEY DIVISION

### STATEMENT OF MAJ. GEN. THOMAS A. SANDS, DIVISION COMMANDER

**ACCOMPANIED BY:**

**FRED BAYLEY III, CHIEF, ENGINEERING DIVISION**
**EUGENE NETTLES, CHIEF, PROGRAMS MANAGEMENT OFFICE**
**RODGER HARRIS, EXECUTIVE ASSISTANT**
**GENE LAWHUN, CHIEF OF PLANNING**

### OPENING REMARKS

Senator JOHNSTON. The hearing will come to order.

This morning, we continue our hearings on the fiscal year 1988 budget for the Corps of Engineers. We will receive status reports from Maj. Gen. Thomas A. Sands, Division Commander of the Lower Mississippi Valley Division, and president of the Mississippi River Commission, and from Col. Thomas A. Rhen, Division Engineer of the New England Division.

We extend a warm welcome to each of you.

First, General Sands, if you would introduce your staff who are accompanying you and then proceed in your own way. We have, of course, full statements which will be put into the record. Please proceed.

### INTRODUCTION OF ASSOCIATES

General SANDS. Thank you very much, Mr. Chairman. It is a pleasure to be here to discuss our fiscal year 1988 budget request. Members of my staff with me here today are, on my left, Mr. Fred Bayley, the Chief of our Engineering Division; Mr. Gene Nettles, Chief of the Programs Division; and behind me in the audience is Mr. Rodger Harris, our Executive Assistant, and Mr. Gene Lawhun who joined us in October as the Chief of our Planning Division.

As you suggested, Mr. Chairman, if it is OK with you, I would ask that our complete statement be included in the record and I would like to summarize our activities in fiscal year 1988.

Mr. Chairman, our area of responsibility is some 150,000 square miles in a seven-state area along the Mississippi River. We execute our program through our district offices in St. Louis, Memphis, Vicksburg and New Orleans.

## OCTOBER 1986 FLOOD

I would like to begin with a brief discussion of a flood event that occurred in late September and early October in the midsection of our country. As you are aware, this section of the country experienced widespread rainfall which caused exceedingly high stages along the Meramec and the Mississippi Rivers. This rain severely tested the flood protection works within the city of St. Louis. A couple of slides here are of some of those areas, and then a couple of them show what it looked like during the high river stages. The road in front of the St. Louis Gateway Arch is about 4 to 5 feet under water.

The protection works withstood very well with the exception of one area in East St. Louis, where a locally maintained area had a problem with a malfunctioning drain gate, causing some $35 million in damages within the East St. Louis area.

Failures in private levees along the Missouri River caused an additional problem. This is an area just north of St. Charles on the Missouri River. It allowed the Missouri River to cut a new 12-mile-long path. You see highlighted there in the area from the Missouri over to the Mississippi, and that peninsula that you see there was basically inundated with flood waters, causing a considerable amount of damage.

I guess the thing that is not said and was not said about this flood event is the damages that were prevented. Protection works and reservoir storage projects in the Kansas City District, in the Missouri River Division, functioned extremely well. They held back some 8 feet of water on the stages that we had, which meant that without those particular projects, we would have equalled or bettered the 1844 flood of record.

In addition, Clarence Cannon Dam, which has been recently put into operation in the last couple of years, played a significant role in that the water levels in the lake were some 22 feet higher than normal.

In addition, south of St. Louis we got considerable flooding along the Mississippi River. The point of these slides is so you will notice the emergency protection works that were put up by the local interests that really went a long way in preventing additional damages.

## LOCK AND DAM 26, ALTON, ILL.

As you might expect, we had some problems with our lock and dam 26 area as a result of the high stages which were exascerbated by the problem of the Missouri taking a new path for some of its flows into the Mississippi River just north of this facility. We were pretty well along our way with our lock under construction in June 1986. We had some 95 percent of the foundation pile in, and we were already beginning our concrete placement.

During the high water stages, we decided that it was necessary to rewater the cofferdam area. We did this initially by reducing the effectiveness of our dewatering system. As the stages got higher, we decided that it was necessary to go ahead and open the emergency flood gates, and we did reflood the cofferdam. This is a slide, the last one we took, at the high stage. River stages were within about 6 inches of overtopping the cofferdam.

Of course, this emergency operation was taken in order to prevent what we would consider catastrophic damages to the foundation area. This did set us back about 3 months in our construction schedule for this particular project.

## COMPARISON OF FISCAL YEARS 1987 AND 1988 PROGRAMS

This slide shows a general comparison of our fiscal years 1988–87 budgets for our combined Lower Mississippi Valley Division and Mississippi River Commission programs. The funds requested will continue our programs at an optimum rate to meet the schedules that we last reported to Congress.

I would like first to touch on our Lower Mississippi Valley Division programs. Our general investigations portion of that program provides for the initiation of one new flood damage prevention study. This is a reconnaissance phase study of the Cuivre River area in eastern Missouri and includes both the Salt and the Cuivre River basins.

## LOUISIANA COASTAL STUDIES

We will also continue with the Louisiana coastal area land loss and marsh creation and the shore and barrier island erosion feasibility studies. These studies, as you are well aware, are being cost shared by the state of Louisiana. The Louisiana coastal area hurricane protection reconnaissance report, initiated in fiscal year 1987, will be completed in fiscal year 1988.

## WEST BANK OF THE MISSISSIPPI RIVER IN THE VICINITY OF NEW ORLEANS, LA.

On the west bank of the Mississippi, our hurricane protection study efforts, we have completed the feasibility report for hurricane protection between the Westwego and the Harvey Canal. We will continue these studies in the remaining areas.

To remind you, this is a slide after Hurricane Juan of the West Jefferson area. This is an area that does get extensive flooding during a hurricane.

### SHOCCOE DAM, PEARL RIVER, MISS.

On the Pearl River area, we are prepared to negotiate a cost-sharing agreement for the Pearl River Shoccoe Dam project. This is Shoccoe Dam; it is in the preconstruction engineering and design phase. The dam is designed to alleviate extensive flooding in the Jackson, Miss., area.

This is a slide of the 1983 flood event in Jackson. This is not the high water stage. The high water stage is indicated by that little white line on the bricks there that appears to be about 3½ feet higher than the water level that exists in the slide.

Turning now to our construction, general program, this slide is a comparison of our fiscal years 1988 and 1987 programs. This will provide for the continuation of 14 projects and the completion of 1.

### RED RIVER WATERWAY, LA.

Along the Red River Waterway, we are assuring that our efforts will provide navigation to the city of Alexandria by the end of calendar year 1987. Funds enacted by the Congress in 1987 will be used for—this is a slide of John H. Overton lock and dam which will be completed this year.

We will begin, with fiscal year 1987 funds, work on lock and dam 3, six realignments and one revetment in pool 3, and a realignment in each of pools 4 and 5. Our fiscal year 1988 funds will be used to complete or continue these particular projects.

### MISSISSIPPI RIVER, SHIP CHANNEL

Mississippi River, ship channel where we are in the process now of evaluating the changes to the local cost-sharing agreement on this particular project, which is designed for the first phase to provide 45-foot navigation along the Mississippi up to mile 181. Construction of this phase will be initiated this year.

### MISSISSIPPI RIVER-BATON ROUGE TO THE GULF

On our Mississippi River-Baton Rouge to the gulf project, we are extremely concerned about the deterioration of the bank line along the Mississippi River below Venice and in Southwest Pass. Maintenance costs continue to escalate as a result of the deteriorating bank line which is quite prolificly shown in this slide.

Senator JOHNSTON. What causes the bank line to deteriorate?

General SANDS. That is just the erosion and the subsidence in the area, sir, that causes the bank line to erode. Of course, when that occurs, it causes some problems in our being able to effectively maintain the Southwest Pass.

Our current effort here is basically rehabilitation of this area through the use of foreshore dikes and placing dredged material behind the dikes. This slide is kind of a description of what we have planned. The pink area on the map indicates those areas that we have worked on; the yellow, those areas that are currently scheduled, and of course, the black is our program for the future. The little dotted areas on the South Pass and in Pass a Loutre are areas that would be required for a channel in excess of 50-foot navigation on the Mississippi River.

Senator JOHNSTON. You say they are works that will be required for a channel in excess of 50 feet?

General SANDS. If we go to the 50-foot navigation range, we would have to have training works in those two passes, also.

Senator JOHNSTON. Why is that?

General SANDS. To put more of the flows out through Southwest Pass so that the flow rate would be more effective in reducing sedimentation in the Southwest Pass area.

Senator JOHNSTON. You reduce the flow in South Pass and Pass a Loutre in order to increase the flow in the Southwest Pass?

General SANDS. That is correct, sir. We stopped maintaining South Pass in about 1980.

This slide is a description of what the project looks like, Senator. We do use maintenance dredging materials to put behind the rock dikes. As a matter of fact, on our 45-foot channel project, we would be using the material from that particular project as part of our restoration effort along the bank.

### MISSISSIPPI RIVER-GULF OUTLET SHIPLOCK

Turning now to our Mississippi River-gulf outlet Shiplock, better known as the industrial harbor navigation canal lock. The economic analysis of this project is pretty well outdated. In October we began a reanalysis, looking at the economics of this particular project, and in doing so, we will reevaluate the Violet site as the location for construction of the lock.

As you are aware, right now, we are going along the path to rehabilitate or replace the shiplock at the existing site.

### PEARL RIVER, ST. TAMMANY PARISH, LA.

We signed a cost-sharing agreement on the Pearl River, St. Tammany Parish project with the local interests. Funds requested will continue preconstruction engineering and design. We are scheduled to complete this design in April 1989. This is a slide of the types of residences that are flooded in this area.

Within south Louisiana, we currently have four hurricane protection projects that are under construction.

### GRAND ISLE AND VICINITY, LA.

Grand Isle, as you may recall, in 1985 we were basically complete with that project, or almost complete, when we had a series of three hurricanes that caused considerable damage to the project. We are in the process now of reopening this particular project. Even though it was severely damaged, it is credited with preventing some $12 to $14 million in damages.

### LAKE PONTCHARTRAIN AND VICINITY, LA.

Within the Lake Pontchartrain and vicinity hurricane protection project, we will be essentially completing the Chalmette unit, which, as you know, is in St. Bernard Parish in the lower right of the slide, with only final levee shaping and raising remaining. This will be done around the 1991 timeframe. The New Orleans East unit will also be essentially complete, with the only major remaining work consisting of raising the levees along the outfall canal from the London, 17th Street and the Orleans pumping stations and the closure levee at St. Johns Bayou. There will also be some minor levee raising at a future date to offset settlement.

The raising of levees in the Jefferson Parish unit will begin in fiscal year 1988. The St. Charles Parish unit is scheduled to begin in fiscal year 1989.

### LAROSE TO GOLDEN MEADOW, LA.

Our Larose to Golden Meadow project. With fiscal year 1988 funds once again, we will basically complete all the first lifts of levees with the exception of a 3½-mile section. You can see the levee to the left center of the slide along the rectangular portion of the borrow area. When we complete this particular first lift, we will, in fact, provide the basic design level hurricane protection.

As you recall, construction in this area presents a problem. Because of the settling of the levees, we will have to come back in future years to take care of whatever settlement does actually occur by adding additional lifts.

This is a slide of the 1985 flooding in this particular area. As you know, it was particularly widespread.

### MISSISSIPPI RIVER AND TRIBUTARIES PROJECT

Our Mississippi River Commission budget figures shown in this slide compare the fiscal years 1988 and 1987 funds requested. This will take care of our general investigations program, our construction program, and our maintenance program for the Mississippi River and tributaries project.

### YAZOO BASIN PROJECT

We will be continuing our work in the Yazoo basin, particularly in that area involving the Yazoo demonstration erosion control program, which is a joint Corps of Engineers-Soil Conservation Service program.

We are developing watershed plans in the six areas that you see outlined on the slide, which basically is a systems approach to looking at erosion, sedimentation, and flooding problems in these areas.

We are using simple approaches to address these three problem areas. Here is an example in Batupan Bogue where we have taken an area using some very basic engineering-type construction and it has proven thus far to be effective in reducing erosion. Another example is the drop structure along the Hotophia Creek.

## MISSISSIPPI DELTA REGION—CAERNARVON STRUCTURE

We will initiate Caernarvon structure in the Mississippi delta region in 1987 with fiscal year 1987 funds.. We are working right now with the local interests. We are working on a cost-sharing agreement to provide for the construction of this project. As it stands right now, the state has agreed; the New Orleans District will be forwarding that particular agreement to us in the very near future.

## ATCHAFALAYA BASIN

Within the Atchafalaya basin, we will be continuing our efforts to acquire the real estate that is involved in the flood control efforts, particularly that involved in restricting the development of habitable structures.

Senator JOHNSTON. Say again, please?

General SANDS. We are in the process of acquiring real estate interests, as you know, Senator, within the Atchafalaya basin. Funds were appropriated in the 1985 Supplemental Appropriations Act to provide for acquisition of portions of the real estate. We are going to have generally three types of acquisitions. One is the flowage easements that we needed on some 89,000 acres within the basin; then additional developmental control easements within the basin, which was basically aimed at preventing the development of habitable structures; and then an environmental easement. We are currently developing a real estate design memorandum for the acquisition of the flood control and developmental control easements, and we will continue this particular process.

We are very pleased with the efforts within the Atchafalaya basin to improve its flood-carrying capacity. As you recall, at the time of the 1973 flood, the Atchafalaya basin floodway could only convey about 60 percent of the design flood flows. Since that time, we have raised in excess of 79 miles of the floodway levee system to design grade. This is a slide showing the floodwalls in the Morgan City area and we continue with levee work within the Atchafalaya basin.

After the completion of work using our fiscal year 1988 funds, we will be within 10 percent of the flood-carrying capacity of the floodway. The floodway is designed to carry flood flows of some 1.5 million cubic feet per second. We are very pleased with this particular effort.

## MISSISSIPPI RIVER LEVEES

We will continue our work on the Mississippi River levee systems. Within the New Orleans metropolitan area there are some 70 miles of levees and floodwalls. We have completed about 46 miles. Only 200 feet in the Avondale Ship Repair Yards in the Westwego area remain below project flood flow line and this section will be under construction this fiscal year.

Our programs for fiscal years 1987 and 1988 include funds to initiate construction on about one-half of the 24 miles of deficient levees within the New Orleans metropolitan area. This has been a very effective program.

The reach of the Mississippi River levee system that continues to deeply concern us is that area along the west bank of the Mississippi from opposite Greenville, Miss., extending some 234 miles to the Old River Control Structure.

Various sections of this reach are deficient from 1 to 8 feet. This slide is an example of one of the more significantly deficient ones. We are working very closely with the state of Louisiana in order to ensure that we continue to look at this very important area.

## OLD RIVER CONTROL STRUCTURE

The Old River Control Structure, which has been for many years the No. 1 civil works project in the Corps of Engineers, is basically complete. It is currently in an operational test phase. Things are going extremely well. We will schedule the dedication ceremony for this project on May 2, 1987. We certainly hope that you would be able to attend that dedication, Senator.

## PREPARED STATEMENT

Sir, that completes the statement that I have. We will be prepared to answer any questions that you might have at this time.

[The statement follows:]

## STATEMENT OF MAJ. GEN. THOMAS A. SANDS

### OPENING REMARKS

GOOD MORNING, MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE. I AM PLEASED TO APPEAR BEFORE THE SUBCOMMITTEE TO DISCUSS THE LOWER MISSISSIPPI VALLEY DIVISION AND THE MISSISSIPPI RIVER AND TRIBUTARIES PROJECT FISCAL YEAR 1988 CIVIL WORKS BUDGET REQUEST. I AM MAJOR GENERAL THOMAS A. SANDS, DIVISION COMMANDER AND PRESIDENT OF THE MISSISSIPPI RIVER COMMISSION. MR. FRED BAYLEY, MY CHIEF OF ENGINEERING, AND MR. GENE NETTLES, CHIEF OF PROGRAMS, WILL ASSIST IN PRESENTING TESTIMONY. IN ADDITION, SEATED BEHIND ME ARE MY NEW CHIEF OF PLANNING, MR. GENE LAWHUN, AND MY EXECUTIVE ASSISTANT, MR. RODGER HARRIS.

### AREA OF RESPONSIBILITY

THE LOWER MISSISSIPPI VALLEY DIVISION HAS CIVIL WORKS RESPONSIBILITY IN A 150,000-SQUARE-MILE AREA IN SEVEN STATES BORDERING THE MISSISSIPPI RIVER GENERALLY FROM ST. LOUIS IN THE NORTH TO THE GULF OF MEXICO IN THE SOUTH. WE HAVE DISTRICT OFFICES LOCATED AT ST. LOUIS, MEMPHIS, VICKSBURG, AND NEW ORLEANS.

THE AREA UNDER JURISDICTION OF THE MISSISSIPPI RIVER COMMISSION IS THE ALLUVIAL VALLEY OF THE MISSISSIPPI RIVER FROM CAPE GIRARDEAU, MISSOURI, TO THE GULF OF MEXICO.

WITH YOUR PERMISSION, MR. CHAIRMAN, I WOULD LIKE TO SUMMARIZE MY STATEMENT AND ASK THAT THE COMPLETE STATEMENT BE PLACED IN THE RECORD OF THE HEARINGS. I WOULD FIRST LIKE TO DISCUSS A FLOOD EVENT THAT OCCURRED ON THE MISSOURI AND UPPER MISSISSIPPI RIVERS AND HOW IT IMPACTED OUR ST. LOUIS DISTRICT. THEN I WILL DISCUSS OUR FISCAL YEAR 1988 BUDGET REQUEST AND THE STATUS OF SOME OF OUR

PROJECTS AND THE PROGRESS WE ARE MAKING IN PROVIDING FLOOD CONTROL AND NAVIGATION BENEFITS TO THE PEOPLE IN MY AREA OF JURISDICTION.

## OCTOBER 1986 FLOOD EVENT

IN LATE SEPTEMBER 1986, THE MID-SECTION OF THE COUNTRY WEST OF THE MISSISSIPPI EXPERIENCED WIDESPREAD RAINFALL WHICH CAUSED HIGH STAGES ALONG THE MISSOURI, MERAMEC, AND MISSISSIPPI RIVERS. THIS HIGH WATER TESTED THE LEVEE SYSTEMS AND FLOODWALLS BUILT THROUGHOUT THE ST. LOUIS DISTRICT. FEDERALLY CONSTRUCTED PROTECTION GENERALLY FUNCTIONED AS DESIGNED. AN EXCEPTION WAS THE LOCALLY MAINTAINED PUMP STATION IN EAST ST. LOUIS, ILLINOIS. RESIDENTS OF EAST ST. LOUIS WERE VICTIMS OF FLOODING RESULTING FROM A MALFUNCTIONING OF A DRAIN GATE IN THE PUMP STATION. DAMAGES IN THIS AREA WERE ESTIMATED AT $35 MILLION. FAILURES IN PRIVATE LEVEES ON THE MISSOURI RIVER, NORTH OF ST. CHARLES, MISSOURI, ALLOWED THE RIVER TO CUT A NEW TWELVE-MILE LONG PATH TO THE MISSISSIPPI NEAR PORTAGE DES SOUIX, MISSOURI, INUNDATING WEST ALTON, MISSOURI. RESERVOIR PROJECTS ON THE MISSOURI RIVER IN THE KANSAS CITY DISTRICT PREVENTED THE RIVER STAGES FROM EXCEEDING THE 1844 FLOOD OF RECORD. THESE RESERVOIRS HELD BACK AN ADDITIONAL EIGHT FEET OF WATER AT THE CREST. THE TRUMAN DAM ALONE PREVENTED AN ESTIMATED $131.3 MILLION IN DAMAGES IN THE ST. LOUIS DISTRICT.

## CLARENCE CANNON DAM

CLARENCE CANNON DAM AND MARK TWAIN LAKE ON THE SALT RIVER, LOCATED 120 MILES NORTHWEST OF ST. LOUIS PLAYED A BIG PART IN THE PREVENTION OF FLOOD DAMAGES IN THE ST. LOUIS DISTRICT. THE LAKE SURFACE PEAKED 22 FEET ABOVE NORMAL WHICH PREVENTED AN ESTIMATED $18.6 MILLION IN DAMAGES IN THE SALT AND MISSISSIPPI RIVER VALLEYS.

GENERATION OF HYDROPOWER IS ANOTHER FUNCTION OF THE CANNON DAM PROJECT. THE DAM WAS PLACED INTO OPERATION IN JULY 1983 AND BY JANUARY 1984 THE LAKE WAS UP TO NORMAL ELEVATION. IN NOVEMBER 1984, THE POWER PLANT WENT INTO OPERATION. DURING CALENDAR YEAR 1985, 176 MILLION KILOWATT HOURS OF ELECTRICITY WERE PRODUCED, WHICH WAS TWICE AS MUCH AS PREDICTED. $2 MILLION IN REVENUE WAS COLLECTED BY THE TREASURY DEPARTMENT FOR THE HYDROPOWER PLANT OPERATIONS.

AT STE. GENEVIEVE, MISSOURI, SEVERAL PRIVATE LEVEES CREVASSED AND 6,000 ACRES WERE FLOODED.

## LOCK AND DAM 26 REPLACEMENT

LOCK AND DAM 26(R) CONTINUED ON SCHEDULE DURING FISCAL YEAR 1986. SINCE LAST YEAR, THE COFFERDAM FOR THE LOCK WAS COMPLETED AND DEWATERED BY MARCH 1986. BY SEPTEMBER 1986, THE FOUNDATION PILE DRIVING WAS OVER 95% COMPLETE, AND CONCRETE PLACEMENT WAS UNDERWAY.

DURING THE RECENT FLOODING, WITH THE MISSOURI RIVER NOW DISCHARGING ADDITIONAL WATER UPSTREAM OF THE PROJECT, THE CREST ELEVATION WAS WITHIN INCHES OF OVERTOPPING THE COFFERDAM OF LOCK AND DAM 26(R). THIS OVERTOPPING COULD HAVE CAUSED EXTENSIVE DAMAGES TO THE FOUNDATION OF THE COFFERDAM. THE DECISION TO PARTIALLY FILL THE COFFERDAM BY SLOWING DOWN THE PROJECT DEWATERING SYSTEM WAS A PROTECTIVE MEASURE TAKEN TO PRECLUDE THESE DAMAGES. APPROXIMATELY 20 FEET OF WATER HAD FILLED THE INTERIOR OF THE COFFERDAM WHEN THE CONTRACTOR'S ACCESS ROAD TO THE SITE SHIFTED, CAUSING A LOSS OF CONTROL IN THE DEWATERING SYSTEM. IN ORDER TO PREVENT ANY FOUNDATION DAMAGE, THE EMERGENCY

REWATERING SYSTEM WAS ACTIVATED TO EQUALIZE THE HEAD DIFFERENTIAL. THE CONTRACTOR HAS COMPLETED REPAIRS TO THE ACCESS ROAD AND DEWATERING SYSTEM AND CONSTRUCTION IS BACK UNDERWAY. WE HAVE EXPERIENCED ABOUT A 3-MONTH DELAY.

DESIGN OF THE SECOND LOCK AND PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT IS CONTINUING.

## COMPARISON OF FISCAL YEAR 1987 AND FISCAL YEAR 1988 PROGRAMS

OUR FISCAL YEAR 1988 BUDGET REQUEST FOR THE LOWER MISSISSIPPI VALLEY DIVISION AND MISSISSIPPI RIVER COMMISSION PROGRAMS OF $710 MILLION COMPARES VERY FAVORABLY WITH ALLOCATIONS OF $669 MILLION FOR THESE PROGRAMS IN FISCAL YEAR 1987. RECEIPT OF THESE FUNDS WILL PERMIT US TO CONTINUE OUR PROGRAMS AT THE OPTIMUM RATE TO MEET COMPLETION DATES LAST REPORTED TO CONGRESS. A NUMBER OF STUDIES AND PROJECTS CONTAINED IN OUR BUDGET REQUEST REFLECT COST SHARING BETWEEN THE FEDERAL GOVERNMENT AND LOCAL INTERESTS IN ACCORDANCE WITH THE WATER RESOURCES DEVELOPMENT ACT OF 1986, PUBLIC LAW 99-662.

## LOWER MISSISSIPPI VALLEY DIVISION

I WOULD NOW LIKE TO REPORT ON THE PROGRAM THAT COMES UNDER MY JURISDICTION AS COMMANDER, LOWER MISSISSIPPI VALLEY DIVISION.

## GENERAL INVESTIGATIONS PROGRAM

OUR GENERAL INVESTIGATIONS PROGRAM PROVIDES FOR INITIATION OF 1 NEW FLOOD DAMAGE PREVENTION RECONNAISSANCE PHASE STUDY, CONTINUATION OF FEASIBILITY PHASE ON 2 NAVIGATION AND 13 FLOOD DAMAGE PREVENTION STUDIES, COMPLETION OF 2 FLOOD DAMAGE PREVENTION STUDIES, AND CONTINUATION OF PRECONSTRUCTION ENGINEERING AND DESIGN ON 3 FLOOD DAMAGE PREVENTION STUDIES.

## CUIVRE RIVER AREA STUDY

THE NEW RECONNAISSANCE PHASE STUDY IS OF THE CUIVRE RIVER AREA IN EASTERN MISSOURI AND INCLUDES THE SALT AND CUIVER RIVER BASINS. WE WILL STUDY THE NEED AND FEASIBILITY FOR IMPROVEMENTS TO REDUCE BOTH URBAN AND AGRICULTURAL FLOOD DAMAGES WHICH OCCUR ANNUALLY.

## LOUISIANA COASTAL AREA STUDY

THE BUDGET REQUEST INCLUDES FUNDS TO CONTINUE THE LOUISIANA COASTAL AREA LAND LOSS AND MARSH CREATION AND THE SHORE AND BARRIER ISLAND EROSION FEASIBILITY STUDIES. THESE STUDIES ARE BEING COST SHARED WITH THE STATE OF LOUISIANA. WE FOUND IT NECESSARY TO DROP THE WATER SUPPLY FEASIBILITY STUDY FROM THE BUDGET BECAUSE OF A LACK OF LOCAL FUNDING OF COST SHARING DUE TO STATE BUDGET CONSTRAINTS.

THE LOUISIANA COASTAL AREA HURRICANE PROTECTION RECONNAISSANCE STUDY, INITIATED IN FY 1987, IS SCHEDULED TO BE COMPLETED IN FY 1988. INCLUDED IN THE BUDGET REQUEST ARE FUNDS TO CONTINUE THIS STUDY INTO THE FEASIBILITY PHASE.

## WEST BANK OF THE MISSISSIPPI RIVER IN THE VICINITY OF THE NEW ORLEANS, LOUISIANA

ON THE WEST BANK OF THE MISSISSIPPI RIVER IN THE VICINITY OF NEW ORLEANS STUDY, WE HAVE COMPLETED A FEASIBILITY REPORT FOR HURRICANE PROTECTION OF THE AREA BETWEEN WESTWEGO AND THE HARVEY CANAL. WE WILL CONTINUE STUDIES OF THE REMAINING AREAS COVERED BY THE RESOLUTION IN FY 1988.

## PEARL RIVER, SHOCCOE

ON THE SHOCCOE DAM PROJECT LOCATED ON THE PEARL RIVER NORTH OF JACKSON, MISSISSIPPI, WE ARE PREPARING TO NEGOTIATE A COST-SHARING AGREEMENT WITH THE PEARL RIVER BASIN DEVELOPMENT DISTRICT FOR CONSTRUCTION OF THE PROJECT. FUNDS REQUESTED WILL BE USED TO CONTINUE PRECONSTRUCTION ENGINEERING AND DESIGN.

## CONSTRUCTION GENERAL PROGRAM

TURNING NOW TO OUR DIVISION CONSTRUCTION PROGRAM. OUR BUDGET REQUEST IS FOR $233.8 MILLION WHICH IS AN INCREASE OF $19.5 MILLION OVER OUR ALLOCATION FOR FISCAL YEAR 1987. THESE FUNDS WILL PROVIDE FOR CONTINUATION OF 14 PROJECTS AND COMPLETION OF 1 PROJECT. I HAVE PREVIOUSLY DISCUSSED THE STATUS OF WORK AT LOCK AND DAM 26 REPLACEMENT AND THE SECOND LOCK. I WOULD NOW LIKE TO REPORT ON THE STATUS OF A FEW OTHER PROJECTS.

## OUACHITA AND BLACK, ARKANSAS AND LOUISIANA

THE APPROPRIATIONS ACTS FOR FISCAL YEARS 1984 THROUGH 1987 PROVIDED ADDITIONAL FUNDS FOR THE OUACHITA AND BLACK PROJECT TO CONSTRUCT RECREATION FACILITIES IN THE FELSENTHAL POOL AT FULL FEDERAL EXPENSE. CONSTRUCTION OF THESE FACILITIES IS PROCEEDING, AND THEY ARE SCHEDULED TO BE COMPLETED BY THE SUMMER OF 1988.

## RED RIVER WATERWAY

ON THE RED RIVER WATERWAY, ADDITIONAL FUNDS RECEIVED IN FY 1986 ON LOCK AND DAM 3 ARE BEING USED TO CONSTRUCT A PORTION OF THE COFFERDAM AND STONE PLACEMENT ALONG THE EXISTING RIVER BANK TO PROTECT THE LOCK AND DAM CONSTRUCTION SITE AND ALSO TO CONSTRUCT THE COGNAC REVETMENT IN POOL 3. THE REMAINDER OF THE FUNDS ARE

TO BE APPLIED TO THE INITIAL EXCAVATION CONTRACT. IN FY 1987, WE WILL CONTINUE OUR EFFORT TO HAVE A NINE-FOOT NAVIGATION CHANNEL TO ALEXANDRIA IN 1987. FUNDS ADDED BY THE CONGRESS WILL BE USED TO INITIATE CONTRACTS IN FY 1987 FOR LOCK AND DAM 3, SIX REALIGNMENTS AND ONE REVETMENT ITEM IN POOL 3 AND A REALIGNMENT IN EACH OF POOLS 4 & 5. FUNDS REQUESTED FOR FY 1988 WILL BE USED TO CONTINUE THESE ITEMS.

## MISSISSIPPI RIVER SHIP CHANNEL, GULF TO BATON ROUGE, LOUISIANA

A LOCAL COOPERATION AGREEMENT WAS SIGNED 30 JUNE 1986 ON THE FIRST PHASE OF THE MISSISSIPPI RIVER SHIP CHANNEL PROJECT. THIS PHASE OF CONSTRUCTION WILL PROVIDE A 45-FOOT CHANNEL FROM THE GULF TO MILE 181 NEAR DONALDSONVILLE, LOUISIANA, AND INCLUDES SALTWATER INTRUSION MITIGATION MEASURES. CONSTRUCTION OF THIS FIRST PHASE WILL BE INITIATED IN FY 1987.

## MISSISSIPPI RIVER, BATON ROUGE TO THE GULF

UNLESS CONTINUING BANK DETERIORATION ALONG THE MISSISSIPPI RIVER BELOW VENICE, LOUISIANA, IS ARRESTED AND CONFINEMENT OF FLOW ENHANCED, MAINTENANCE COSTS WILL CONTINUE TO INCREASE. THIS WORK HAS BEEN ONGOING UNDER THE CONSTRUCTION AUTHORITY. IT IS CONSIDERED THAT THE IMPETUS FOR ACCOMPLISHING THIS WORK IS TO REDUCE THE MAINTENANCE DREDGING REQUIREMENT; THEREFORE, WORK REMAINING AFTER FY 1988 WILL BE SCHEDULED UNDER THE OPERATIONS AND MAINTENANCE PROGRAM BASED ON REQUIREMENTS TO MAINTAIN THE NAVIGATION CHANNEL THROUGH DREDGING AND BANK RESTORATION.

## MISSISSIPPI RIVER-GULF OUTLET-SHIPLOCK

THE DATA BASE FOR THE ECONOMIC ANALYSIS FOR THE MISSISSIPPI RIVER-GULF OUTLET LOCK HAS BECOME OBSOLETE. IN PARTICULAR, THE TRAFFIC DATA BASE AND THE TRANSPORTATION RATES HAVE BEEN IMPACTED BY CHANGING ECONOMIC CONDITIONS PERTINENT TO THE STUDY. A REANALYSIS OF THE ECONOMICS ALONG WITH UPDATED ENGINEERING STUDIES WAS INITIATED IN OCTOBER 1986. THE PREVIOUSLY RECOMMENDED CONSTRUCTION OF THE LOCK AT THE VIOLET SITE WILL ALSO BE RESTUDIED.

## PEARL RIVER, SLIDELL

WE HAVE SIGNED A COST-SHARING AGREEMENT ON THE PEARL RIVER, SLIDELL, LOUISIANA, PROJECT WITH LOCAL INTERESTS. FUNDS REQUESTED WILL CONTINUE PRECONSTRUCTION ENGINEERING AND DESIGN, WHICH IS SCHEDULED FOR COMPLETION IN APRIL 1989.

## SOUTH LOUISIANA HURRICANE PROTECTION PROJECTS

THERE ARE FOUR HURRICANE PROTECTION PROJECTS UNDER CONSTRUCTION IN SOUTH LOUISIANA; ONE AUTHORIZED BUT NOT STARTED; ONE WHERE THE SURVEY REPORT HAS JUST BEEN COMPLETED; AND GENERAL INVESTIGATION STUDIES ARE UNDERWAY ON ONE OTHER SPECIFIC AREA AS WELL AS A GENERAL REVIEW OF HURRICANE PROTECTION FOR ALL OF COASTAL LOUISIANA.

## GRAND ISLE

THE STRUCTURAL PORTION OF THE GRAND ISLE HURRICANE PROTECTION PROJECT WAS ESSENTIALLY COMPLETED IN AUGUST 1984, AND DUNE VEGETATION PLANTING WAS ACCOMPLISHED IN THE LATE SUMMER 1985. STORMS IN THE WINTER OF 1984/85 AND THREE HURRICANES DURING 1985 CAUSED SEVERE DAMAGE TO THE PROJECT. DESPITE ITS DAMAGED STATE

FROM THE EARLIER WINTER STORMS, THE PROJECT PREVENTED AN ESTIMATED $12-$14 MILLION IN STRUCTURAL DAMAGE DURING THE BATTERING FROM THREE HURRICANES. RESTORATION OF THE PROJECT WILL INCLUDE RECONSTRUCTION AND HARDENING OF THE DUNE AGAINST FUTURE DAMAGE AND RENOURISHMENT OF THE BEACH.

## LAKE PONTCHARTRAIN AND VICINITY

WITH FUNDS REQUESTED FOR THE LAKE PONTCHARTRAIN HURRICANE PROJECT, THE CHALMETTE UNIT WILL BE ESSENTIALLY COMPLETE WITH ONLY FINAL LEVEE SHAPING AND RAISING REMAINING. THIS WILL BE ACCOMPLISHED IN THE FY 1991 TIMEFRAME AFTER LEVEES HAVE HAD SUFFICIENT TIME TO SETTLE AND CONSOLIDATE. THE NEW ORLEANS EAST UNIT ALSO WILL BE ESSENTIALLY COMPLETE IN THAT THE ONLY MAJOR REMAINING WORK WILL CONSIST OF RAISING LEVEES ALONG THE OUTFALL CANALS FOR THE LONDON, 17TH STREET, AND ORLEANS PUMPING PLANTS AND THE CLOSURE LEVEE AT ST. JOHNS BAYOU. THE RAISING OF LEVEES IN NEW ORLEANS WEST UNIT-JEFFERSON PARISH TO HIGH LEVEL PLAN ELEVATIONS WILL BEGIN IN FY 1988 WHILE THE WORK IN ST. CHARLES PARISH IS SCHEDULED TO BEGIN IN FY 1989. CONSTRUCTION TO DATE PROVIDES SIGNIFICANT PROTECTION TO A LARGE PORTION OF THE NEW ORLEANS AND VICINITY AREA.

## LAROSE TO GOLDEN MEADOW

THE LAROSE TO GOLDEN MEADOW PROJECT WILL PROVIDE HURRICANE PROTECTION TO THE INHABITED LAND ALONG BAYOU LAFOURCHE. FLOODING FROM HURRICANE JUAN CAUSED SOME CHANGES IN PRIORITY IN THE PROJECT SCHEDULE. CONSTRUCTION OF LEVEES IN TWO AREAS THAT FLOODED DURING JUAN WERE RESCHEDULED; THE AWARD FOR SECTION C NORTH WAS ADVANCED TO JANUARY 1988, AND A CONTRACT TO CLOSE THE GAP AT BULLY CAMP CANAL HAS BEEN SCHEDULED FOR AWARD IN FY 1987 WITH CONSTRUCTION CONTINUING INTO FY 1988. WITH FUNDS REQUESTED, CONSTRUCTION WILL BE COMPLETE OR UNDERWAY FOR ALL FIRST LIFT

LEVEES EXCEPT A 3-1/2-MILE SECTION ON THE EAST SIDE OF BAYOU LAFOURCHE. THAT CONTRACT IS SCHEDULED TO BE INITIATED IN FY 1989 AND COMPLETED IN FY 1990, CLOSING THE LOOP WITH FIRST LIFT LEVEE CONSTRUCTION. FIRST LIFT CONSTRUCTION RAISES THE LEVEES TO REQUIRED ELEVATION FOR PROTECTION, BUT TWO ADDITIONAL LIFTS ARE LATER REQUIRED TO COMPENSATE FOR CONSOLIDATION AND SETTLEMENT.

## NEW ORLEANS TO VENICE

THE NEW ORLEANS TO VENICE PROJECT WILL PROVIDE HURRICANE PROTECTION TO THE NARROW STRIPS OF LAND ALONG BOTH BANKS OF THE MISSISSIPPI RIVER SOUTH OF NEW ORLEANS. DURING THE BUDGET YEAR, WE WILL COMPLETE ENLARGEMENT OF ONE LEVEE ITEM IN REACH B-2 AND ONE LEVEE ITEM IN REACH C; AWARD 2 ADDITIONAL LEVEE ITEMS IN REACH C AND ONE IN REACH B-1; AND CONTINUE PLANNING FOR LEVEE PROTECTION IN THE LOWER REACHES OF THE PROJECT.

## MISSISSIPPI RIVER COMMISSION PROGRAM

TURNING NOW TO THE MISSISSIPPI RIVER AND TRIBUTARIES PROJECT ACCOUNT WHICH COMES UNDER MY JURISDICTION AS PRESIDENT OF THE MISSISSIPPI RIVER COMMISSION. THE FISCAL YEAR 1988 REQUEST IS FOR $317 MILLION WHICH IS $6.2 MILLION GREATER THAN OUR ALLOCATION FOR FISCAL YEAR 1987.

## GENERAL INVESTIGATIONS PROGRAM

FUNDS REQUESTED WILL PROVIDE FOR 16 ACTIVITIES UNDER THE GENERAL INVESTIGATIONS PROGRAM. WE WILL CONTINUE SEVEN FEASIBILITY STUDIES AND COMPLETE ONE AND WE WILL CONTINUE SIX PRECONSTRUCTION ENGINEERING AND DESIGN STUDIES AND COMPLETE ONE. WE WILL ALSO CONTINUE OUR COLLECTION OF BASIC DATA EFFORT.

## MISSISSIPPI-LOUISIANA ESTUARINE AREA

OUR FINAL FEASIBILITY REPORT ON THE MISSISSIPPI-LOUISIANA ESTUARINE AREA RECOMMENDED DIVERTING WATER FROM THE MISSISSIPPI RIVER TO THE LAKE PONTCHARTRAIN BASIN AND MISSISSIPPI SOUND AT A SITE ADJACENT (UPSTREAM) TO THE BONNET CARRE' SPILLWAY. FY 1988 FUNDS WILL BE USED FOR PRECONSTRUCTION ENGINEERING AND DESIGN ACTIVITIES.

## TUSCUMBIA RIVER BASIN

FUNDS WERE ADDED BY THE CONGRESS IN FISCAL YEAR 1987 TO INITIATE A RECONNAISSANCE-PHASE STUDY OF THE FLOOD, SOIL EROSION AND SILTATION CONTROL, AND RELATED LAND AND WATER RESOURCES PROBLEMS IN THE TUSCUMBIA RIVER BASIN, WHICH IS LOCATED IN ALCORN AND PRENTISS COUNTIES, MISSISSIPPI. THE RECONNAISSANCE PHASE OF THE STUDY WILL BE COMPLETED IN DECEMBER 1987. FUNDS REQUESTED IN FISCAL YEAR 1988 ARE TO INITIATE THE FEASIBILITY PHASE OF THE STUDY WHICH WILL REQUIRE 50-50 COST SHARING BY FEDERAL AND NON-FEDERAL INTERESTS.

## HORN LAKE CREEK AND TRIBUTARIES INCLUDING COW PEN CREEK

FUNDS WERE ADDED BY THE CONGRESS IN FISCAL YEAR 1987 TO INITIATE PRECONSTRUCTION ENGINEERING AND DESIGN ACTIVITIES FOR IMPROVEMENTS FOR FLOOD CONTROL AND RELATED LAND AND WATER RESOURCES PROBLEMS IN THE HORN LAKE CREEK BASIN, WHICH IS LOCATED IN EXTREME NORTHWEST MISSISSIPPI AND SOUTHWEST TENNESSEE. PRECONSTRUCTION ENGINEERING AND DESIGN ACTIVITIES ARE SCHEDULED FOR COMPLETION IN SEPTEMBER 1989.

## CONSTRUCTION PROGRAM

OUR REQUEST FOR CONSTRUCTION FUNDS UNDER THE MISSISSIPPI RIVER AND TRIBUTARIES ACCOUNT WILL ALLOW US TO CONTINUE WORK ON 11 PROJECTS IN THE CONSTRUCTION CATEGORY AND 1 UNDER THE DAM SAFETY ASSURANCE PROGRAM.

## ST. FRANCIS BASIN

THE ST. FRANCIS BASIN PROJECT IS LOCATED IN SOUTHEASTERN MISSOURI AND NORTHEASTERN ARKANSAS. THE PROJECT, UPON ITS COMPLETION, WILL PROVIDE PROTECTION AGAINST HEADWATER FLOODS OF THE ST. FRANCIS AND LITTLE RIVERS TO AN AREA OF OVER 1.4 MILLION ACRES. THE FUNDS REQUESTED IN FISCAL YEAR 1988 WILL PERMIT BRIDGE RELOCATION WORK AND CONSTRUCTION OF EIGHT CHANNEL ITEMS REPRESENTING 80 MILES OF CHANNEL IMPROVEMENTS. CONSTRUCTION OF THIS PROJECT IS PROGRESSING AT A VERY GOOD RATE.

## TENSAS BASIN

THE MAJOR ONGOING WORK IN THE TENSAS BASIN PROJECT IS THE $18+ MILLION TENSAS-COCODRIE PUMPING PLANT STRUCTURE WHICH IS IN THE FINAL STAGES OF CONSTRUCTION. COMPLETION IS SCHEDULED FOR THE SPRING OF 1987.

## YAZOO BASIN
## DEMONSTRATION EROSION CONTROL PROJECT

FOR FY 1987 THE CORPS WAS APPROPRIATED $7.2 MILLION FOR CONTINUATION OF THE DEMONSTRATION EROSION CONTROL PROJECT, A JOINT PROJECT WITH THE SOIL CONSERVATION SERVICE. THE PURPOSE OF THE DEMONSTRATION EROSION CONTROL PROJECT IS TO DEMONSTRATE THE APPLICABILITY OF A SYSTEMS APPROACH TO THE SOLUTION OF EROSION, SEDIMENTATION AND FLOODING PROBLEMS BY DESIGN AND CONSTRUCTION OF WORKS IN DEMONSTRATION WATERSHEDS IN NORTHEAST MISSISSIPPI.

DURING FY 1987 THE CORPS WILL CONTINUE TO DEVELOP THE SYSTEM PLANS AND TO CONSTRUCT USABLE INCREMENTS OF WORK.

OUR FY 1988 REQUEST CONTAINS $5.3 MILLION FOR CONTINUATION OF THIS PROGRAM.

## MISSISSIPPI DELTA REGION

OUR BUDGET REQUEST INCLUDES FUNDS FOR CONTINUATION OF CONSTRUCTION OF THE MISSISSIPPI DELTA REGION PROJECT, WHICH PROVIDES STRUCTURES TO DIVERT FRESHWATER OUT OF THE MISSISSIPPI RIVER AND INTO ADJACENT COASTAL AREAS FOR PURPOSES OF SALINITY CONTROL AND FISH AND WILDLIFE ENHANCEMENT. INITIAL CONSTRUCTION FUNDS WERE PROVIDED BY CONGRESS IN FY 1987 AND ARE BEING USED FOR RIGHTS-OF-WAY ACQUISITION AND RELOCATIONS FOR THE CAERNARVON STRUCTURE ON THE EAST BANK OF THE RIVER. THE BUDGET REQUEST INCLUDES FUNDS FOR THE AWARD OF THE CONSTRUCTION CONTRACT FOR THE CAERNARVON STRUCTURE. ALTHOUGH THE WATER RESOURCES DEVELOPMENT ACT OF 1986 PROVIDED THAT THIS PROJECT WOULD BE CONSTRUCTED AT FULL FEDERAL COST BECAUSE OF THE NATIONAL SIGNIFICANCE OF THE FISH AND WILDLIFE ENHANCEMENT MEASURES, NEGOTIATION WITH THE STATE OF LOUISIANA IS ONGOING TO SEEK 25 PERCENT NON-FEDERAL FUNDING ON A VOLUNTARY BASIS.

## ATCHAFALAYA BASIN FLOODWAY SYSTEM

IN FY 1987, WE INITIATED CONTRACTS FOR MAPPING, TITLE EVIDENCE, AND APPRAISALS; WE WILL PREPARE A REAL ESTATE DESIGN MEMORANDUM FOR THE ACQUISITION OF FLOWAGE AND DEVELOPMENTAL CONTROL EASEMENTS OVER 59,000 ACRES AND DEVELOPMENTAL CONTROL EASEMENTS OVER 329,000 ACRES. FY 1988 FUNDS WILL BE USED TO CONTINUE ACQUISITION ACTIVITIES FOR THESE EASEMENTS.

## ATCHAFALAYA BASIN

THE DESIGN OF THE MISSISSIPPI RIVER AND TRIBUTARIES PROJECT PROVIDES FOR THE ATCHAFALAYA BASIN FLOODWAY TO CONVEY HALF OF THE PROJECT FLOOD FLOWS TO THE GULF OF MEXICO. THE FLOODWAY'S CAPACITY--WITH AUTHORIZED FREEBOARD--WAS 850,000 CUBIC FEET PER SECOND AT THE TIME OF THE 1973 FLOOD. WITH FUNDS APPROPRIATED FROM FY 1973 THROUGH FY 1987, WE WILL HAVE RAISED 79.3 MILES OF LEVEES AND FLOODWALLS IN 73 SEPARATE CONTRACTS AT A TOTAL COST OF $329 MILLION. THIS WORK WILL RESULT IN A DRAMATIC INCREASE IN THE FLOOD-CARRYING CAPACITY OF THE FLOODWAY TO 1.1 MILLION CUBIC FEET PER SECOND.

WORK COMPLETED WITH FUNDS REQUESTED IN FY 1988 WILL FURTHER INCREASE THE FLOOD-CARRYING CAPACITY OF THE FLOODWAY TO 1.4 MILLION CUBIC FEET PER SECOND. THIS BRINGS US TO WITHIN 10 PERCENT OF THE FLOODWAY'S DESIGN CAPACITY OF 1.5 MILLION CUBIC FEET PER SECOND.

WE NOW HAVE DESIGN UNDERWAY ON THE WAX LAKE OUTLET CONTROL STRUCTURE. GENERAL DESIGN WAS COMPLETED IN OCTOBER 1985 AND PREPARATION OF PLANS AND SPECIFICATIONS IS UNDERWAY. THE CONTRACT IS SCHEDULED TO BE AWARDED IN MAY 1987.

## MISSISSIPPI RIVER LEVEES

TURNING TO THE MISSISSIPPI RIVER LEVEES. IN THE METROPOLITAN NEW ORLEANS AREA, THERE IS A TOTAL OF 70.4 MILES OF LEVEES AND FLOODWALLS. WE HAVE COMPLETED 46.4 MILES, AND THERE ARE 24.0 MILES AT THE BEGINNING OF FY 1987 DEFICIENT IN GRADE AND/OR CROSS-SECTION. OF THESE, ONLY 200 FEET AT AVONDALE REPAIR YARDS IN WESTWEGO ARE BELOW PROJECT FLOOD FLOWLINE. THIS SECTION WILL BE UNDER CONSTRUCTION IN FY 1987.

OUR PROGRAM FOR FY 1987 AND 1988 INCLUDES FUNDS TO INITIATE CONSTRUCTION ON ABOUT HALF OF THE DEFICIENT LEVEES WITHIN THE METROPOLITAN NEW ORLEANS AREA.

THE REACH OF MISSISSIPPI RIVER LEVEES THAT CONTINUES TO DEEPLY CONCERN ME IS THAT REACH ON THE WEST BANK FROM OPPOSITE GREENVILLE, MISSISSIPPI, TO THE OLD RIVER STRUCTURE IN LOUISIANA. IMMEDIATELY FOLLOWING THE 1973 FLOOD, OUR ANALYSIS SHOWED THERE WERE 234 MILES OF LEVEE IN THIS REACH WHICH WERE DEFICIENT IN GRADE FROM 1 TO 8 FEET. SINCE THAT TIME, WE HAVE ONLY RAISED TO GRADE APPROXIMATELY 30 PERCENT OF THE DEFICIENT LEVEES. THIS IS NOW OUR MOST CRITICAL REACH. A LEVEE BREAK SCENARIO IN THIS REACH SHOWS THAT 1.8 MILLION ACRES AND 25,000 HOMES WOULD BE FLOODED, 74,000 PEOPLE WOULD BE DISLOCATED, AND 1,100 MILES OF PUBLIC ROADS WOULD BE DAMAGED. ESTIMATED DAMAGES WOULD APPROACH $1 BILLION IN THE AREA NORTH OF OLD RIVER. DAMAGES IN THE ATCHAFALAYA BASIN BELOW OLD RIVER WOULD BE VIRTUALLY IMMEASURABLE. THE WORK IN THIS AREA IS NOT PROGRESSING AT ANYWHERE NEAR THE RATE AT WHICH WE WOULD LIKE TO SEE IT. THE MAJOR PROBLEM CONTINUES TO BE LOCAL INTERESTS' INABILITY TO FURNISH RIGHTS-OF-WAY IN A TIMELY MANNER. THIS IS DIRECTLY RELATED TO THE COST INVOLVED IN ACQUIRING THE LANDS. THE COST OF THE LANDS REQUIRED RANGE BETWEEN $100 AND $300 THOUSAND PER MILE OF LEVEE RAISE. WE PRESENTLY HAVE PLANS AND SPECIFICATIONS READY ON ABOUT 17 MILES OF LEVEE THAT WE DON'T HAVE RIGHTS-OF-WAY AVAILABLE.

## OLD RIVER

CONSTRUCTION OF THE AUXILIARY STRUCTURE AT OLD RIVER, WHICH HAS BEEN THE NUMBER ONE PROJECT IN THE CORPS' CIVIL WORKS PROGRAM FOR A NUMBER OF YEARS, IS ESSENTIALLY COMPLETE, AND THE NEW STRUCTURE

IS NOW IN FULL OPERATION. THIS RESTORES THE OLD RIVER COMPLEX ORIGINALLY INTENDED CAPABILITIES AND MARKS THE CLOSE OF A MAJOR CHAPTER IN THE MISSISSIPPI RIVER AND TRIBUTARIES PROJECT. DEDICATION OF THE STRUCTURE IS SCHEDULED FOR MAY 2, 1987.

MR. CHAIRMAN, THIS COMPLETES MY STATEMENT. I WILL BE HAPPY TO ANSWER ANY QUESTIONS THE COMMITTEE MIGHT HAVE.

## RED RIVER WATERWAY, LA.

Senator Johnston. Thank you very much, General Sands.

General Sands, could you give the committee the updated cost data on the Red River Waterway project?

General Sands. Yes, sir; as it stands right now, we allocated, through fiscal year 1987, somewhere in the neighborhood of $779 million. Our request for fiscal year 1988 is $87 million, which would leave us a balance to complete after fiscal year 1988 of $178 million on those items scheduled, with an unscheduled balance to complete of $519 million.

Senator Johnston. So that the total to complete would be $697 million?

General Sands. Yes, sir.

Senator Johnston. So we are more than halfway through with the project then?

General Sands. That is correct, sir.

Senator Johnston. And the estimated cost is down from what it was a few years ago, isn't it?

General Sands. Sir, our bids have been good. On those items that we are advertising for construction, the bids have been very, very competitive. We are getting a good project for the price at this particular point in time.

Senator Johnston. Don't I recall that at one point the project cost estimate being $1.7 billion? This would put it at about $1.5 billion total. Do I recall that?

General Sands. Senator, $1.5 billion is our present estimate for the project. I am not sure that represents a major change from the past.

Senator Johnston. I think there was higher inflation in there.

General Sands. This year's estimate is a decrease of $18 million from last year. Those are just adjustments that we have made in the project as a result of the bids that we have gotten on the project and reduced inflation allowances. The highest cost estimate we have carried was in fiscal year 1982 when the estimate was $1.6 billion.

Senator Johnston. The prices on the project are very good now; they are better than they have been.

General Sands. The competitive market in the construction industry right now is quite good.

Senator JOHNSTON. The numbers are about 40 percent less than they were; isn't that right?

General SANDS. Well, the last item that we awarded on the Red River Waterway was some 30 percent less than what we had expected it would cost.

Senator JOHNSTON. What types of commodities are expected to move on the waterway?

General SANDS. Sir, it is anticipated commodities which will be moved on the waterway will include iron and steel products, such as pipe; industrial chemicals; paper and paper products; petroleum and petroleum products; sulfur and various metals and ores; agricultural chemicals; and grains.

### STATUS OF WORK IN POOL 2

Senator JOHNSTON. On pool 2, you should have that pool completed by the end of this calendar year?

General SANDS. Yes, sir; we will have all of the items within pools 1 and 2 that are necessary for navigation to Alexandria completed by the end of this calendar year.

Senator JOHNSTON. And the pool will be filled by the end of this calendar year?

General SANDS. Yes, sir; it will be up to pool stage by the end of this calendar year.

Senator JOHNSTON. Early December or late December?

General SANDS. I would imagine it is going to be late December.

### USE OF FISCAL YEAR 1987 FUNDS

Senator JOHNSTON. Congress, in Public Law 99–591, gave the Corps of Engineers specific instructions regarding lock and dam No. 3; and the realignment and bank stablilization measures in pools 3, 4, and 5. Is the Corps complying with the law?

General SANDS. Yes, sir; we are. All of those items will be initiated. As I indicated in my statement, we are in the process of doing that right now. Those items will be initiated with the fiscal year 1987 funds, and we will continue those particular items with our fiscal year 1988 funding.

### INITIATION OF LOCK AND DAM 3 CONSTRUCTION

Senator JOHNSTON. When will a continuing contract for lock and dam No. 3 construction be awarded?

General SANDS. March 1988.

Senator JOHNSTON. March 1988?

General SANDS. Yes, sir.

Senator JOHNSTON. And that will be the entire contract for lock and dam No. 3? A single contract?

General SANDS. Yes, sir.

Senator JOHNSTON. How much of it will be completed prior to the time you let that contract?

General SANDS. That contract that we will be awarding in March 1988 will be the continuing contract for the lock and dam structure. This is the last phase of a multiphase project for the construction of lock and dam No. 3.

Senator JOHNSTON. Is there anything that you could be doing that will not be done to accelerate completion of lock and dam No. 3?

General SANDS. No, sir; as it stands right now, the schedule we have for lock and dam No. 3 is the most engineeringly feasible schedule that we have for lock and dam No. 3.

Senator JOHNSTON. In other words, you will have the plans in place. You are required by the law to let the contract, a continuing contract. There is no delay. There is money in the budget request so that, in effect, the Congress has done all it can, and you are doing all that you can to get lock and dam No. 3 completed at the earliest possible feasible time?

General SANDS. Yes, sir.

### STATUS OF LOCK AND DAM 4 DESIGN

Senator JOHNSTON. With respect to lock and dam No. 4, what is the critical path on lock and dam No. 4 at this time?

General SANDS. The Vicksburg District, either this week or within the coming weeks, will be negotiating with architect-engineer firms for the design of lock and dam No. 4.

Senator JOHNSTON. Will they, in effect, once they hire one, let a contract for the entire lock and dam No. 4?

General SANDS. That will be for the design of lock and dam No. 4, Senator; yes, sir.

Senator JOHNSTON. I mean, you, in effect, let a contract?

General SANDS. A full letting of the contract for design of a lock and dam system.

Senator JOHNSTON. They don't do that in stages?

General SANDS. No, sir.

Senator JOHNSTON. Will they be commissioned, then, to proceed at the optimum rate to get the design complete, or are there various rates of progress negotiated in the design contract?

General SANDS. When we sit down with the architect-engineer firms to make our selection for the design of the project, that is one of the items that we will discuss. We do give them a set maximum amount of time that we want them to perform within. In this case, we would expect the design would be completed by the November 1990 timeframe.

Senator JOHNSTON. Is that optimum? I mean, can you go faster than that from an engineering point of view?

General SANDS. Sir, that would depend upon the architect-engineer firm selected. It possibly could be accelerated, but I am not in a position at the moment to really respond to that. We sit down with the architect-engineer firm to determine exactly how long he visualizes he would take in the design process. That is our best estimate right now, that this particular lock and dam effort would be about a 3½-year design effort for the architect-engineer firm.

### PROJECT COMPLETION ASSUMING $100 MILLION ANNUAL FUNDING

Senator JOHNSTON. All right. General, if we were to assume level funding of about $100 million a year, which, frankly, is my tentative goal, what would be the soonest time you could finish the project to Shreveport through lock and dam No. 5?

General SANDS. Senator, I would say that that is going to take us somewhere between the 1993 to 1995 timeframe. I would really have to look at those particular figures to determine what kind of engineeringly feasible schedule could be met with that particular level of funding.

Senator JOHNSTON. I am intrigued. If you are not finished with the design until November 1990, it would be conceivable that you could finish not only lock and dam No. 4 but No. 5, as well, by 1993?

General SANDS. As it stands right now, Senator, the basic engineering and construction effort initially was based on sequential construction of the locks and dams. We would have to take a look to determine whether we could or not. As I indicated, we feel very comfortable with the design phase on lock and dam No. 4 right now. We would really have to take a look to determine within our manpower resource level what kind of engineeringly feasible schedule we could come up with for the remainder of the project, based on that level of funding that you suggested.

### SIMULTANEOUS CONSTRUCTION OF LOCKS AND DAMS 4 AND 5

Senator JOHNSTON. Would it not be prudent, considering the benefits which come from navigation to Shreveport and considering that lock and dam No. 4 doesn't get you anywhere, wouldn't it be prudent to proceed simultaneously on lock and dam Nos. 4 and 5?

General SANDS. Well, sir, if you have the engineering capability to do that, obviously, with a major construction project of this kind, the quicker you can get it done, the better off you are, considering the project in isolation. Of course, I think that is true of any kind of construction effort within the construction industry. That would be the kind of approach that would have to be taken.

Senator JOHNSTON. Given the level of funding, let's say $100 million, wouldn't you assume that it would be better to design both locks and dam 4 and 5 simultaneously, and then proceed with both projects simultaneously so they could be completed at about the same time?

General SANDS. There would be some overlap commensurate with that particular level of funding that you are talking about. But yes, sir; if you have the resources available to design and construct those things at the same time, you could certainly do that.

Senator JOHNSTON. You say if you do?

General SANDS. If you had. I would have to take a look based on the funding levels that you have just suggested to determine whether or not we could work within that particular level of funding.

Senator JOHNSTON. When did the Corps plan to negotiate with an architect-engineer firm for the design of lock and dam No. 5?

General SANDS. We haven't made a decision right now, Senator, as to whether or not that would be done by an outside architect-engineering firm or whether or not that would be done with in-house resources. Certainly, that is an alternative. That is part of the decisionmaking process that we would have to go through to determine, based on the question that you posed earlier relative to funding levels, how we would go about setting up a schedule to complete the project like that.

That is one of the alternatives that we look at, who is going to design, an outside design firm or in-house design team?

As it stands, right now, that design effort for lock and dam 5 would probably begin in the 1991 timeframe and be completed in the 1994 timeframe.

### DESIGN AND CONSTRUCTION SCHEDULE

Senator JOHNSTON. General, as you know, there has been some reluctance to go with the most optimum rate on the entire project by the Department of the Army. Could you furnish for the record a schedule of what you consider to be the optimum rate and a schedule for completion given a level of funding of around $100 million a year?

General SANDS. Yes, sir; we will take a look at that type of funding level, and we will provide you with an optimum rate schedule.

Senator JOHNSTON. Including all major milestones.

General SANDS. Yes, sir.

[The information follows:]

### SCHEDULES FOR REMAINING WORK

The following tables represent maximum capability based on engineering considerations, and schedule based on an annual effort costing approximately $100 million per year.

All work in pools 3, 4, and 5, except for engineering and design and except for those items initiated in response to Public Law 99-591, remains unscheduled.

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
MAJOR DESIGN DOCUMENT

| DOCUMENT | START | FINISH | REMARKS |
|---|---|---|---|
| POOL 4 | | | |
| General Design Memorandum | Jun 84 | Jun 87 | Funding required is included in Engineering and Design for each Pool as appropriate to complete Design documents as scheduled |
| Detailed Design Memorandum | Jan 88 | Jun 89 | |
| Plans and Specifications | Jan 89 | Nov 90 | |
| POOL 5 | | | |
| Hydrology and Hydraulic Design Memorandum | Jan 85 | Jun 87 | Funding required is included in Engineering and Design for each Pool as appropriate to complete Design documents as scheduled |
| General Design Memorandum | Jan 85 | Dec 87 | |
| Detailed Design Memorandum | Nov 87 | Sep 89 | |
| Plans and Specifications | Mar 89 | Feb 91 | |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
OPTIMUM ENGINEERING SCHEDULE
SUMMARY

| POOL | TOTAL FUNDING BY FISCAL YEAR ($000) | | | | | | | CONTINGENCIES |
|---|---|---|---|---|---|---|---|---|
| | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | ($000) |
| 1 | 795 | 7,389 | 1,982 | 1,457 | 1,132 | 1,503 | 2,000 | 7,178 |
| 2 | 32,180 | 20,669 | 8,298 | 3,960 | 3,959 | 3,700 | 3,768 | 12,019 |
| 3 | 43,699 | 48,600 | 39,644 | 42,451 | 26,128 | 2,416 | 2,408 | 30,248 |
| 4 | 18,366 | 30,950 | 28,147 | 44,726 | 50,652 | 50,471 | 50,192 | 2,143 |
| 5 | 8,650 | 6,316 | 6,600 | 27,523 | 68,296 | 54,580 | 52,743 | 1,224 |
| TOTAL FEDERAL AND NON-FEDERAL | 103,690 | 113,924 | 84,671 | 120,117 | 150,167 | 112,610 | 110,511 | 52,812 |
| FEDERAL APPROPRIATION | 101,803 | 111,143 | 79,507 | 113,273 | 143,046 | 106,045 | 104,039 | 51,653 |
| NON-FEDERAL CONTRIBUTIONS | 1,887 | 2,781 | 5,164 | 6,844 | 7,121 | 6,565 | 6,472 | 1,159 |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
OPTIMUM ENGINEERING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| POOL 1 | | | | | | | | | | | |
| Moncla Bridge | Sep 89 | 249 | Oct 89 | | | 249 | | | | | |
| Hog Lake Auxiliary Control Structure | | 2,145 | Mar 87 | | | | | | | | 745 |
| Lock and Dam 1, Channel Repair | Nov 89 | 800 | Oct 89 | | | 800 | | | | | |
| Recreation Facilities | Varies | 10,513 | Varies | | 1,119 | 824 | 1,187 | 1,000 | 1,383 | 2,000 | 1,966 |
| Miscellaneous Channel Work | Varies | 6,080 | Varies | | 6,080 | | | | | | |
| Miscellaneous Contingencies | | | | | | | | | | | 4,467 |
| Engineering and Design | -- | 27,220 | -- | 570 | 10 | 10 | 250 | 12 | 11 | | |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
OPTIMUM ENGINEERING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Supervision and Administration | -- | 20,373 | -- | 225 | 100 | 99 | 20 | 120 | 109 | | |
| TOTAL POOL 1 (FEDERAL AND NON-FEDERAL) | | | | 795 | 7,389 | 1,982 | 1,457 | 1,132 | 1,503 | 2,000 | 7,178 |
| TOTAL FEDERAL | | | | 795 | 6,775 | 1,573 | 873 | 639 | 822 | 1,015 | 6,929 |
| TOTAL NON-FEDERAL | | | | 0 | 614 | 409 | 584 | 493 | 681 | 985 | 249 |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
OPTIMUM ENGINEERING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | |
| POOL 2 | | | | | | | | | | | |
| Louisiana and Arkansas Railroad Bridge | Jun 87 | 27,691 | Sep 87 | 12,076 | 3,011 | | | | | | 944 |
| Mo-Pac Railroad Bridge | Mar 88 | 12,547 | Jun 88 | 1,050 | 5,750 | 4,110 | | | | | 1,637 |
| John H. Overton Lock and Dam | -- | 119,379 | Nov 82 | 2,593 | | | | | | | |
| Colfax Revetment | -- | 2,477 | Mar 87 | | | | | | | | 44 |
| Wiggins Revetment, Phase 2 | -- | 2,435 | Jan 87 | | | | | | | | 226 |
| Darrow Realignment | -- | 8,096 | Feb 87 | 4,229 | | | | | | | 2,476 |
| Deloges Bluff Revetment | -- | 8,891 | Jan 87 | 5,258 | | | | | | | 2,981 |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
OPTIMUM ENGINEERING SCHEDULE

| ITEM | FINISH PLANS & SPEC | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | |
| POOL 2 (CONT) | | | | | | | | | | | |
| Alexandria Front Revetment | Apr 87 | 4,142 | Jun 87 | 2,221 | | | | | | | 547 |
| Initial Dredging | -- | 1,295 | Apr 87 | 486 | | | | 259 | | | |
| Miscellaneous Channel Work | Varies | 8,533 | Varies | 5 | 7,105 | 1,428 | | | | | |
| Miscellaneous Contingencies | | | | | | | | | | | 827 |
| Recreation Facilities | Varies | 21,731 | Varies | 1,181 | 3,328 | 1,189 | 2,560 | 2,500 | 2,500 | 2,500 | 2,287 |
| Engineering and Design | -- | 28,883 | -- | 1,281 | 475 | 450 | 400 | 200 | 200 | 268 | |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
OPTIMUM ENGINEERING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | |
| POOL 2 (CONT) | | | | | | | | | | | |
| Supervision and Administration | -- | 20,986 | -- | 1,800 | 1,000 | 1,121 | 1,000 | 1,000 | 1,000 | 1,000 | |
| TOTAL POOL 2 (FEDERAL AND NON-FEDERAL) | | | | 32,180 | 20,669 | 8,298 | 3,960 | 3,959 | 3,700 | 3,768 | 12,019 |
| TOTAL FEDERAL | | | | 30,755 | 18,724 | 7,692 | 2,623 | 2,851 | 2,240 | 2,325 | 11,109 |
| TOTAL NON-FEDERAL | | | | 1,425 | 1,945 | 606 | 1,337 | 1,108 | 1,460 | 1,443 | 910 |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
OPTIMUM ENGINEERING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | |
| POOL 3 | | | | | | | | | | | |
| Lock and Dam 3 | Oct 87 | 159,608 | Mar 88 | 15,400 | 28,037 | 30,000 | 38,000 | 21,658 | | | 23,255 |
| Lock and Dam 3, Phase II-B | Complete | 4,539 | Mar 87 | 1,847 | | | | | | | 892 |
| Lock and Dam 3, Phase II-C | Complete | 1,126 | May 87 | 26 | | | | | | | |
| St. Maurice Realignment | -- | 8,132 | Mar 87 | 4,272 | | | | | | | 1,060 |
| Kadesh Realignment | -- | 6,803 | Mar 87 | 2,916 | | | | | | | 887 |
| Socot Realignment | Mar 87 | 6,375 | May 87 | 1,000 | 815 | | | | | | 360 |
| Powhattan Realignment | Apr 87 | 7,275 | Sep 87 | 1,600 | 2,430 | | | | | | 949 |
| Nantachie/Red Bayou Revetment | Jun 88 | 1,800 | Sep 88 | 50 | 1,750 | | | | | | |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
OPTIMUM ENGINEERING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | |
| POOL 3 (CONT) | | | | | | | | | | | |
| Crain Revetment | Jun 88 | 1,640 | Sep 88 | 40 | 1,600 | | | | | | |
| Eureka Revetment | Jun 88 | 2,765 | Sep 88 | 50 | 2,715 | | | | | | |
| Lumbra Revetment | -- | 2,310 | May 87 | 1,511 | | | | | | | 299 |
| Ile Au Vaches Realignment | Mar 87 | 7,390 | Jun 87 | 3,550 | 1,340 | | | | | | |
| Campti Realignment | Feb 87 | 4,625 | Sep 87 | 2,700 | 425 | | | | | | |
| Smith Island Realignment | Apr 87 | 5,470 | Sep 87 | 3,350 | 707 | | | | | | 713 |
| Fausse Downstream Extension | Oct 89 | 565 | Jan 90 | | | 565 | | | | | |
| Cadney Capout | Dec 89 | 370 | Mar 90 | | | 370 | | | | | |
| Bourb-Tyrge Capout | Jan 90 | 370 | Apr 90 | | | 370 | | | | | |
| Clarence Closure | Mar 90 | 680 | Jun 90 | | | 300 | 300 | | | | |

### RED RIVER WATERWAY
### MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
### FUNDING PROFILE
### OPTIMUM ENGINEERING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | |
| POOL 3 (CONT) | | | | | | | | | | | |
| Miscellaneous Channel Work | Varies | 1,463 | Varies | | | 1,463 | | | | | |
| Wildlife Mitigation Lands | -- | | | | 6,600 | 2,820 | | | | | |
| Recreation Facilities | Varies | 11,230 | Varies | | | 2,000 | 2,000 | 3,230 | 2,000 | 2,000 | |
| Miscellaneous | -- | 492 | -- | | | | | | 250 | 242 | |
| Miscellaneous Contingencies | | | | | | | | | | | 1,833 |
| Engineering and Design | | | | 2,750 | 303 | 263 | 166 | 166 | 166 | 166 | |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
OPTIMUM ENGINEERING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | |
| POOL 3 (CONT) | | | | | | | | | | | |
| Supervision and Administration | | | | 2,637 | 1,878 | 1,493 | 1,905 | 1,074 | | | |
| TOTAL POOL 3 (FEDERAL AND NON-FEDERAL) | | | | 43,699 | 48,600 | 39,644 | 42,451 | 26,128 | 2,416 | 2,408 | 30,248 |
| TOTAL FEDERAL | | | | 43,374 | 48,539 | 38,433 | 41,099 | 24,507 | 1,405 | 1,397 | 30,248 |
| TOTAL NON-FEDERAL | | | | 325 | 61 | 1,211 | 1,352 | 1,621 | 1,011 | 1,011 | 0 |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
OPTIMUM ENGINEERING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | |
| POOL 4 | | | | | | | | | | | |
| Lock and Dam 4 | Nov 90 | 152,202 | Feb 91 | | | | 27,702 | 41,500 | 41,500 | 41,500 | |
| Gahagan Realignment | Oct 87 | 9,625 | Jan 88 | 3,750 | 4,500 | 1,375 | | | | | |
| Westdale Realignment | Aug 89 | 7,831 | Oct 89 | | | 4,500 | 3,331 | | | | |
| Carroll Realignment, Phase I | Complete | 3,000 | Sep 87 | | 1,000 | | | | | | |
| Carroll Realignment, Phase II | Complete | 10,395 | Jun 88 | 800 | 5,000 | 1,452 | | | | | 2,143 |
| Hammel Revetment | Sep 89 | 4,050 | Nov 89 | | | 3,000 | 1,050 | | | | |
| Piermont Realignment | Jan 88 | 10,025 | Mar 88 | 3,500 | 5,000 | 1,525 | | | | | |
| Bull Revetment | Nov 89 | 4,635 | Jan 90 | | | 2,000 | 2,635 | | | | |
| Nicholas Realignment | Jan 88 | 10,110 | Mar 88 | 3,500 | 5,000 | 1,610 | | | | | |

## RED RIVER WATERWAY
## MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
## FUNDING PROFILE
## OPTIMUM ENGINEERING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | |
| POOL 4 (CONT) | | | | | | | | | | | |
| Howard Realignment | Jul 88 | 10,765 | Sep 88 | 50 | 5,000 | 5,715 | | | | | |
| Williams Revetment | Jan 90 | 2,175 | Mar 90 | | | 1,000 | 1,175 | | | | |
| Coushatta Capout | Nov 87 | 5,570 | Feb 88 | 2,500 | 3,070 | | | | | | |
| Recreation Facilities | Varies | 20,726 | Varies | | | 3,500 | 4,500 | 4,500 | 4,500 | 3,726 | |
| Miscellaneous | -- | -- | -- | | | | | | | 716 | |
| Engineering and Design | -- | 27,008 | -- | 4,000 | 1,970 | 1,970 | 971 | 652 | 411 | 250 | |
| Supervision and Administration | -- | 17,835 | -- | 266 | 410 | 500 | 3,362 | 4,000 | 4,000 | 4,000 | |
| TOTAL POOL 4 (FEDERAL AND NON-FEDERAL) | | | | 18,366 | 30,950 | 28,147 | 44,726 | 50,652 | 50,411 | 50,192 | 2,143 |
| TOTAL FEDERAL | | | | 18,263 | 30,799 | 26,420 | 42,466 | 48,243 | 48,209 | 48,370 | 2,143 |
| TOTAL NON-FEDERAL | | | | 103 | 151 | 1,727 | 2,260 | 2,409 | 2,202 | 1,822 | 0 |

# RED RIVER WATERWAY
# MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
## FUNDING PROFILE
## OPTIMUM ENGINEERING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | |
| POOL 5 | | | | | | | | | | | |
| Lock and Dam 5 | Feb 91 | 153,489 | May 91 | | | | 18,639 | 44,950 | 44,950 | 44,950 | |
| Wilkerson Point Realignment | Complete | 9,400 | Jun 87 | 3,650 | 1,176 | | | | | | 1,224 |
| Cecile Revetment | Aug 91 | 2,995 | Oct 91 | | | | | 2,000 | 995 | | |
| Elm Grove Revetment | Nov 90 | 1,975 | Jan 91 | | | | 1,000 | 975 | | | |
| Moss Revetment | Jan 91 | 2,870 | Mar 91 | | | | 1,000 | 1,870 | | | |
| McDade Revetment | Mar 91 | 5,780 | May 91 | | | | 1,500 | 4,280 | | | |
| Sunny Point Dikes | May 91 | 2,085 | Jul 91 | | | | 285 | 1,800 | | | |
| Cupples Revetment | Feb 88 | 1,790 | May 88 | 1,250 | 540 | | | | | | |
| Curtis Revetment | Jul 91 | 3,910 | Sep 91 | | | | | 3,000 | 910 | | |
| Eagle Bend Revetment | Sep 91 | 2,605 | Nov 91 | | | | | 2,000 | 605 | | |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
OPTIMUM ENGINEERING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | |
| POOL 5 (CONT) | | | | | | | | | | | |
| Recreation Facilities | Varies | 15,221 | Varies | | | 3,000 | 3,000 | 3,221 | 3,000 | 3,000 | |
| Miscellaneous | -- | 793 | -- | | | | | | | 793 | |
| Engineering and Design | -- | 24,073 | -- | 3,275 | 4,000 | 3,000 | 1,200 | 700 | 620 | 400 | |
| Supervision and Administration | -- | 13,214 | -- | 475 | 600 | 600 | 899 | 3,500 | 3,500 | 3,000 | |
| TOTAL POOL 5 (FEDERAL AND NON-FEDERAL) | | | | 8,650 | 6,316 | 6,600 | 27,523 | 68,296 | 54,580 | 52,141 | 1,224 |
| TOTAL FEDERAL | | | | 8,616 | 6,306 | 5,389 | 26,212 | 66,806 | 53,369 | 50,932 | 1,224 |
| TOTAL NON-FEDERAL | | | | 34 | 10 | 1,211 | 1,311 | 1,490 | 1,211 | 1,211 | 0 |

# RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
$100 MILLION ANNUAL FUNDING SCHEDULE
SUMMARY

| POOL | TOTAL FUNDING BY FISCAL YEAR ($000) | | | | | | | | CONTINGENCIES |
|---|---|---|---|---|---|---|---|---|---|
| | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | ($000) |
| 1 | 795 | 7,389 | 1,982 | 1,457 | 1,132 | 1,503 | 2,000 | | 7,178 |
| 2 | 32,180 | 20,669 | 8,298 | 3,960 | 3,959 | 3,700 | 3,768 | | 12,019 |
| 3 | 43,699 | 48,600 | 39,644 | 42,451 | 26,128 | 2,416 | 2,408 | | 30,248 |
| 4 | 18,366 | 30,950 | 28,147 | 44,726 | 50,652 | 50,421 | 50,192 | | 2,143 |
| 5 | 8,650 | 6,316 | 6,600 | 8,884 | 40,485 | 53,780 | 51,483 | 47,550 | 1,224 |
| TOTAL FEDERAL AND NON-FEDERAL | 103,690 | 113,924 | 84,671 | 101,478 | 122,356 | 111,810 | 109,851 | 47,550 | 52,812 |
| FEDERAL APPROPRIATION | 101,803 | 111,143 | 79,507 | 94,734 | 115,381 | 105,049 | 103,379 | 47,550 | 51,653 |
| NON-FEDERAL CONTRIBUTIONS | 1,887 | 2,781 | 5,164 | 6,744 | 7,025 | 6,761 | 6,472 | 0 | 1,159 |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
$100 MILLION ANNUAL FUNDING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | |
| POOL 1 | | | | | | | | | | | | |
| Moncla Bridge | Sep 89 | 249 | Oct 89 | | | 249 | | | | | | |
| Hog Lake Auxiliary Structure | | 2,145 | Mar 87 | | | | | | | | | 745 |
| Lock and Dam 1, Channel Repair | Nov 89 | 800 | Oct 89 | | | 800 | | | | | | |
| Recreation Facilities | Varies | 10,513 | Varies | | 1,199 | 824 | 1,187 | 1,000 | 1,383 | 2,000 | | 1,966 |
| Miscellaneous Channel Work | Varies | 6,080 | Varies | | 6,080 | | | | | | | |
| Miscellaneous Contingencies | | | | | | | | | | | | 4,467 |
| Engineering and Design | -- | 27,220 | -- | 570 | 10 | 10 | 250 | 12 | 11 | | | |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
$100 MILLION ANNUAL FUNDING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | |
| Supervision and Administration | -- | 20,373 | -- | 225 | 100 | 99 | 20 | 120 | 109 | | | |
| TOTAL POOL 1 (FEDERAL AND NON-FEDERAL) | | | | 795 | 7,389 | 1,982 | 1,457 | 1,132 | 1,503 | 2,000 | | 7,178 |
| TOTAL FEDERAL | | | | 795 | 6,775 | 1,573 | 873 | 639 | 822 | 1,015 | | 6,929 |
| TOTAL NON-FEDERAL | | | | 0 | 614 | 409 | 584 | 493 | 681 | 985 | | 249 |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
$100 MILLION ANNUAL FUNDING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | |
| POOL 2 | | | | | | | | | | | | |
| Louisiana and Arkansas Railroad Bridge | Jun 87 | 27,691 | Sep 87 | 12,076 | 3,011 | | | | | | | 944 |
| Mo-Pac Railroad Bridge | Mar 88 | 12,547 | Jun 88 | 1,050 | 5,750 | 4,110 | | | | | | 1,637 |
| John H. Overton Lock and Dam | -- | 119,379 | Nov 82 | 2,593 | | | | | | | | |
| Colfax Revetment | -- | 2,477 | Mar 87 | | | | | | | | | 44 |
| Wiggins Revetment, Phase 2 | -- | 2,435 | Jan 87 | | | | | | | | | 226 |
| Darrow Realignment | -- | 8,096 | Feb 87 | 4,229 | | | | | | | | 2,476 |
| Deloges Bluff Revetment | -- | 8,891 | Jan 87 | 5,258 | | | | | | | | 2,981 |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
$100 MILLION ANNUAL FUNDING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| POOL 2 (CONT) | | | | | | | | | | | | |
| Alexandria Front Revetment | Apr 87 | 4,142 | Jun 87 | 2,221 | | | | | | | | 547 |
| Initial Dredging | -- | 1,295 | Apr 87 | 486 | | | | 259 | | | | |
| Miscellaneous Channel Work | Varies | 8,533 | Varies | 5 | 7,105 | 1,428 | | | | | | |
| Miscellaneous Contingencies | | | | | | | | | | | | 827 |
| Recreation Facilities | Varies | 21,731 | Varies | 1,181 | 3,328 | 1,189 | 2,560 | 2,500 | 2,500 | 2,500 | | 2,287 |
| Engineering and Design | -- | 28,883 | -- | 1,281 | 475 | 450 | 400 | 200 | 200 | 268 | | |

## RED RIVER WATERWAY
## MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
## FUNDING PROFILE
## $100 MILLION ANNUAL FUNDING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | |
| POOL 2 (CONT) | | | | | | | | | | | | |
| Supervision and Administration | -- | 20,986 | -- | 1,800 | 1,000 | 1,121 | 1,000 | 1,000 | 1,000 | 1,000 | | |
| TOTAL POOL 2 (FEDERAL AND NON-FEDERAL) | | | | 32,180 | 20,669 | 8,298 | 3,960 | 3,959 | 3,700 | 3,768 | | 12,019 |
| TOTAL FEDERAL | | | | 30,755 | 18,724 | 7,692 | 2,623 | 2,851 | 2,240 | 2,235 | | 11,109 |
| TOTAL NON-FEDERAL | | | | 1,425 | 1,945 | 606 | 1,337 | 1,108 | 1,460 | 1,443 | | 910 |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
$100 MILLION ANNUAL FUNDING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | |
| POOL 3 | | | | | | | | | | | | |
| Lock and Dam 3 | Oct 87 | 159,608 | Mar 88 | 15,400 | 28,037 | 30,000 | 38,000 | 21,658 | | | | 23,225 |
| Lock and Dam 3, Phase II-B | Complete | 4,539 | Mar 87 | 1,847 | | | | | | | | 892 |
| Lock and Dam 3, Phase II-C | Complete | 1,126 | May 87 | 26 | | | | | | | | |
| St. Maurice Realignment | -- | 8,132 | Mar 87 | 4,272 | | | | | | | | 1,060 |
| Kadesh Realignment | -- | 6,803 | Mar 87 | 2,916 | | | | | | | | 887 |
| Socot Realignment | Mar 87 | 6,375 | May 87 | 1,000 | 815 | | | | | | | 360 |
| Powhattan Realignment | Apr 87 | 7,275 | Sep 87 | 1,600 | 2,430 | | | | | | | 949 |
| Nantachie/Red Bayou Revetment | Jun 88 | 1,800 | Sep 88 | 50 | 1,750 | | | | | | | |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
$100 MILLION ANNUAL FUNDING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | |
| POOL 3 (CONT) | | | | | | | | | | | | |
| Crain Revetment | Jun 88 | 1,640 | Sep 88 | 40 | 1,600 | | | | | | | |
| Eureka Revetment | Jun 88 | 2,765 | Sep 88 | 50 | 2,715 | | | | | | | |
| Lumbra Revetment | -- | 2,310 | May 87 | 1,511 | | | | | | | | 299 |
| Ile Au Vaches Realignment | Mar 87 | 7,390 | Jun 87 | 3,550 | 1,340 | | | | | | | |
| Campti Realignment | Feb 87 | 4,625 | Sep 87 | 2,700 | 425 | | | | | | | |
| Smith Island Realignment | Apr 87 | 5,470 | Sep 87 | 3,350 | 707 | | | | | | | 713 |
| Fausse Downstream Extension | Oct 89 | 565 | Jan 90 | | | 565 | | | | | | |
| Cadney Capout | Dec 89 | 370 | Mar 90 | | | 370 | | | | | | |
| Bourb-Tyrge Capout | Jan 90 | 370 | Apr 90 | | | 370 | | | | | | |
| Clarence Closure | Mar 90 | 680 | Jun 90 | | | 300 | 300 | | | | | |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
$100 MILLION ANNUAL FUNDING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | |
| POOL 3 (CONT) | | | | | | | | | | | | |
| Miscellaneous Channel Work | Varies | 1,463 | Varies | | | 1,463 | | | | | | |
| Wildlife Mitigation Lands | -- | | | | 6,600 | 2,820 | | | | | | |
| Recreation Facilities | Varies | 11,230 | Varies | | | 2,000 | 2,000 | 3,230 | 2,200 | 2,000 | | |
| Miscellaneous | -- | 492 | -- | | | | | | 250 | 242 | | |
| Miscellaneous Contingencies | | | | | | | | | | | | 1,833 |
| Engineering and Design | | | | 2,750 | 303 | 263 | 166 | 166 | 166 | 166 | | |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
$100 MILLION ANNUAL FUNDING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | |
| POOL 3 (CONT) | | | | | | | | | | | | |
| Supervision and Administration | | | | 2,637 | 1,878 | 1,493 | 1,905 | 1,074 | | | | |
| TOTAL POOL 3 (FEDERAL AND NON-FEDERAL) | | | | 43,699 | 48,600 | 39,644 | 42,451 | 26,128 | 2,416 | 2,408 | | 30,248 |
| TOTAL FEDERAL | | | | 43,374 | 48,539 | 38,433 | 41,099 | 24,507 | 1,405 | 1,397 | | 30,248 |
| TOTAL NON-FEDERAL | | | | 325 | 61 | 1,211 | 1,352 | 1,621 | 1,011 | 1,011 | | 0 |

# RED RIVER WATERWAY
# MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
## FUNDING PROFILE
## $100 MILLION ANNUAL FUNDING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | |
| POOL 4 | | | | | | | | | | | | |
| Lock and Dam 4 | Nov 90 | 152,202 | Feb 91 | | | | 27,702 | 41,500 | 41,500 | 41,500 | | |
| Gahagan Realignment | Oct 87 | 9,625 | Jan 88 | 3,750 | 4,500 | 1,375 | | | | | | |
| Westdale Realignment | Aug 89 | 7,831 | Oct 89 | | | 4,500 | 3,331 | | | | | |
| Carroll Realignment, Phase I | Complete | 3,000 | Sep 87 | | 1,000 | | | | | | | |
| Carroll Realignment, Phase II | Complete | 10,395 | Jun 88 | 800 | 5,000 | 1,452 | | | | | | 2,143 |
| Hammel Revetment | Sep 89 | 4,050 | Nov 89 | | | 3,000 | 1,050 | | | | | |
| Piermont Realignment | Jan 88 | 10,025 | Mar 88 | 3,500 | 5,000 | 1,525 | | | | | | |
| Bull Revetment | Nov 89 | 4,635 | Jan 90 | | | 2,000 | 2,635 | | | | | |
| Nicholas Realignment | Jan 88 | 10,110 | Mar 88 | 3,500 | 5,000 | 1,610 | | | | | | |

### RED RIVER WATERWAY
### MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
### FUNDING PROFILE
### $100 MILLION ANNUAL FUNDING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | |
| POOL 4 (CONT) | | | | | | | | | | | | |
| Howard Realignment | Jul 88 | 10,765 | Sep 88 | 50 | 5,000 | 5,715 | | | | | | |
| Williams Revetment | Jan 90 | 2,175 | Mar 90 | | | 1,000 | 1,175 | | | | | |
| Coushatta Capout | Nov 87 | 5,570 | Feb 88 | 2,500 | 3,070 | | | | | | | |
| Recreation Facilities | Varies | 20,726 | Varies | | | 3,500 | 4,500 | 4,500 | 4,500 | 3,726 | | |
| Miscellaneous | -- | -- | -- | | | | | | | 716 | | |
| Engineering and Design | -- | 27,008 | -- | 4,000 | 1,970 | 1,970 | 971 | 652 | 411 | 250 | | |
| Supervision and Administration | -- | 17,835 | -- | 266 | 410 | 500 | 3,362 | 4,000 | 4,000 | 4,000 | | |
| TOTAL POOL 4 (FEDERAL AND NON-FEDERAL) | | | | 18,366 | 30,950 | 28,147 | 44,726 | 50,652 | 50,411 | 50,192 | | 2,143 |
| TOTAL FEDERAL | | | | 18,263 | 30,799 | 26,420 | 42,466 | 48,243 | 48,209 | 48,370 | | 2,143 |
| TOTAL NON-FEDERAL | | | | 103 | 151 | 1,727 | 2,260 | 2,409 | 2,202 | 1,822 | | 0 |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
$100 MILLION ANNUAL FUNDING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | |
| POOL 5 | | | | | | | | | | | | |
| Lock and Dam 5 | Feb 91 | 153,489 | May 92 | | | | | 18,639 | 44,950 | 44,950 | 44,950 | |
| Wilkerson Point Realignment | Complete | 9,400 | Jun 87 | 3,650 | 1,176 | | | | | | | 1,224 |
| Cecile Revetment | Aug 91 | 2,995 | Oct 91 | | | | | 2,000 | 995 | | | |
| Elm Grove Revetment | Nov 90 | 1,975 | Jan 91 | | | | 1,000 | 975 | | | | |
| Moss Revetment | Jan 91 | 2,870 | Mar 91 | | | | 1,000 | 1,870 | | | | |
| McDade Revetment | Mar 91 | 5,780 | May 91 | | | | 1,500 | 4,280 | | | | |
| Sunny Point Dikes | May 91 | 2,085 | Jul 91 | | | | 285 | 1,800 | | | | |
| Cupples Revetment | Feb 88 | 1,790 | May 88 | 1,250 | 540 | | | | | | | |
| Curtis Revetment | Jul 91 | 3,910 | Sep 91 | | | | | 3,000 | 910 | | | |
| Eagle Bend Revetment | Sep 91 | 2,605 | Nov 91 | | | | | 2,000 | 605 | | | |

RED RIVER WATERWAY
MISSISSIPPI RIVER TO SHREVEPORT, LOUISIANA
FUNDING PROFILE
$100 MILLION ANNUAL FUNDING SCHEDULE

| ITEM | FINISH PLANS & SPECS | CONST COST EST ($000) | AWARD DATE | FUNDING BY FISCAL YEAR ($000) | | | | | | | | CONTINGENCIES ($000) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | |
| POOL 5 (CONT) | | | | | | | | | | | | |
| Recreation Facilities | Varies | 15,221 | Varies | | | 3,000 | 3,000 | 3,221 | 3,000 | 3,000 | | |
| Miscellaneous | -- | 793 | -- | | | | | | | 793 | | |
| Engineering and Design | -- | 24,073 | -- | 3,275 | 4,000 | 3,000 | 1,200 | 700 | 620 | 400 | | |
| Supervision and Administration | -- | 13,214 | -- | 475 | 600 | 600 | 899 | 2,000 | 2,700 | 2,700 | 2,600 | |
| TOTAL POOL 5 (FEDERAL AND NON-FEDERAL) | | | | 8,650 | 6,316 | 6,600 | 8,884 | 40,485 | 53,780 | 51,843 | 47,550 | 1,224 |
| TOTAL FEDERAL | | | | 8,616 | 6,306 | 5,389 | 7,673 | 39,091 | 52,373 | 50,632 | 47,550 | 1,224 |
| TOTAL NON-FEDERAL | | | | 34 | 10 | 1,211 | 1,211 | 1,394 | 1,407 | 1,211 | 0 | 0 |

## NEED FOR APPROPRIATION BILL LANGUAGE

Senator JOHNSTON. In order to get the design of lock and dams No. 4 and 5 proceeding simultaneously and at the earliest timeframe, would it be necessary that we put language in the appropriations bill to require that?

General SANDS. Well, it is certainly not necessary, because as it stands right now, as I indicated, we are going with the process of designing lock and dam No. 4, and we would plan to continue the design process for lock and dam No. 5.

Senator JOHNSTON. You say you would plan to do that?

General SANDS. Yes, sir.

Senator JOHNSTON. When would you begin that process of negotiation?

General SANDS. As I said, this week, lock and dam No. 4, or within the next few weeks, the Vicksburg District will be in the process of negotiating for design of lock and dam No. 4 with the architect-engineer firms. We would basically plan on starting the design for lock and dam No. 5 in the 1991 timeframe.

Senator JOHNSTON. You would make that decision when?

General SANDS. Our basic effort right now would be to design lock and dam No. 5 in the 1991 timeframe.

Senator JOHNSTON. You mean have it completed?

General SANDS. No, sir. Right now, we would schedule to begin the design of lock and dam No. 5 in the 1991 timeframe.

Senator JOHNSTON. Oh, start the design?

General SANDS. Yes, sir. With the question that you asked about $100 million funding level, obviously, we would have to go back and take a look to determine when we would have to design or start to design lock and dam No. 5.

Senator JOHNSTON. I thought I understood that you could finish the design or you would finish the design of lock and dam No. 4 in November 1990?

General SANDS. Yes, sir.

Senator JOHNSTON. You said at that rate, you could finish the whole project to Shreveport by the 1993 to 1995 timeframe.

General SANDS. That was using the $100 million funding level, Senator. Your question was, with the $100 million a year appropriation, when would we be able, engineeringwise, to complete the project. My best guess right now is the 1993 to 1995 timeframe, but we would really have to go back, sit down and look at our resources, the things that we would have to do, to determine what would, of necessity, be on the critical path for that particular project.

So, I really can't give you very precise answers in relation to that level of funding right now.

Senator JOHNSTON. But you can, for the record, give us those milestones and all those items on the critical path?

General SANDS. We would certainly come up with the schedules for you; yes, sir.

### COMMITMENT TO PROJECT COMPLETION

Senator JOHNSTON. I ask these questions, because I think it is very clear that we have committed ourselves to building the Red River Waterway project to Shreveport. It is already in law; you have your plans set; there is money requested to begin a continuing contract on lock and dam No. 3—and lock and dam No. 3 doesn't get you anywhere. So by committing to lock and dam 3 with the majority of the navigation benefits in Shreveport, you have, in fact, made the commitment to complete the project all the way to Shreveport. I think that is clear. Am I right so far?

General SANDS. That is correct, sir.

Senator JOHNSTON. So, if you are going to Shreveport, you ought to proceed in the most optimum way, balancing available dollars and benefits with time schedules. It seems to me that a funding level of around $100 million a year is a very prudent amount and that we ought to give you a funding level to work with so that we don't waste the government's money and we don't waste time getting it completed.

I don't think that $100 million a year is either beyond our capabilities or unreasonable. I could make a case to go even beyond $100 million, but I think $100 million is a good compromise and it would be our intention to stick to that figure as nearly as possible.

So, what I would like to do is to get that schedule back from you and then, if we need to, and if it is prudent and appropriate, to put those milestones in the law, write it in as bill language. We don't want to load up the bill with a lot of things we don't need, but I think some things may be needed in this case. So, we would like to get that information for the record. Can you furnish all of those milestones for the record?

General SANDS. Yes, sir.

### ENGINEERING AND DESIGN FOR LOCKS AND DAMS 4 AND 5

Senator JOHNSTON. Fine, and you have $4 million for engineering and design on lock and dam No. 4. Could you use more than that?

General SANDS. On the design, no, sir; that is adequate.

Senator JOHNSTON. How about the other features?

General SANDS. That is for the design.

Senator JOHNSTON. How about other features? Could you use more for other features?

General SANDS. No, sir. I think that, as I indicated, our funding request as it stands right now is sufficient to carry on our construction schedule that we reported in an optimum manner.

Senator JOHNSTON. On pool 5, you have $1,275,000 for engineering and design; why is that?

General SANDS. Sir, as I indicated, we have a realignment that we will be doing, one in each of pools 4 and 5.

Senator JOHNSTON. That is the Wilkerson Point realignment in pool 5?

General SANDS. Yes, sir.

Senator JOHNSTON. No part of that would be for engineering design on the lock and dam itself?

General SANDS. No, sir.

Senator JOHNSTON. If you made the decision to go ahead and commit, you couldn't give us a figure at this point as to how much you would need?

General SANDS. No, sir; I really can't, sir.

Senator JOHNSTON. But as part of the milestones, you will not only name the milestone and the date for each one, but you will estimate the cost for each one?

General SANDS. Yes, sir.

Senator JOHNSTON. A complete funding profile?

General SANDS. Yes, sir.

## POTENTIAL SAVING RESULTING FROM SIMULTANEOUS DESIGN AND CONSTRUCTION

Senator JOHNSTON. As part of that, I would appreciate it if you would furnish us with a statement of how much can be saved by simultaneous design and construction based on the most efficient engineering schedules.

General SANDS. Yes, sir.

[The information follows:]

### STATEMENT ON SAVINGS DUE TO SIMULTANEOUS CONSTRUCTION AND EFFICIENT ENGINEERING SCHEDULE

In our most recent experience for construction contract awards, bids have been about 30 percent below what we expected. These contracts were for stone placement and earthwork. Should this trend continue and if the remainder of the project were constructed in the most efficient engineering schedule, including simultaneous construction of locks and dams 4 and 5, we would expect considerable savings to accrue. It would be difficult to put a dollar figure on the savings, however, due to the difficulty you have in predicting future bidding climate and inflation.

## MISSISSIPPI RIVER-BATON ROUGE TO THE GULF

Senator JOHNSTON. Tell the committee about the Mississippi River, Baton Rouge to the gulf project, specifically the major shoaling problems in Southwest Pass.

General SANDS. There has been serious bank deterioration along the lower 10 miles of the Mississippi River and in Southwest Pass for a number of years. Between 1951 and 1982, 2,600 acres of bank were lost due to erosion and subsidence. This has contributed to increased shoaling which has resulted in increased maintenance dredging requirements. It is anticipated that without the bank restoration work maintenance dredging will continue to increase to the point where maintenance of the authorized depth would be impracticable.

Senator JOHNSTON. How is this problem affecting the use of the navigation channel?

General SANDS. At present, the project depth of 40 feet is maintained, on the average, about 70 percent of the time. Restoration of the bank line will enable maintenance of the authorized depth 90 percent of the time.

Senator JOHNSTON. What is the impact in terms of dollar losses?

General SANDS. The reduced depth translates to losses of about $100 million in average annual navigation benefits when compared to maintaining the project depth 90 percent of the time with the bank restoration project in place. Loss of the project depth, which will inevitably occur without the new work, would seriously disrupt the nation's commerce since New Orleans and Baton Rouge are the nation's second and fifth largest ports, respectively.

Senator JOHNSTON. How much will it take to correct this situation?

General SANDS. The restoration of the banks along the lower 10 miles of the Mississippi River and in Southwest Pass, and the rehabilitation of the bulkheads and jetties at the mouth of Southwest Pass, are presently estimated to cost $328 million. This represents a reduction of $29 million since last year, and reflects favorable bid experience on contracts to date. We anticipate that the favorable bid climate will continue for at least the next 6 months. The magnitude of future cost reductions are estimated to be smaller because the cost estimates for upcoming work have been adjusted to reflect recent bid history. The remaining cost to complete the project after fiscal year 1988 is $251,559,000.

Senator JOHNSTON. What are the potential dollar savings when the project is completed?

General SANDS. The potential savings attributable to this project are in two forms. One is the maintenance dredging savings that are estimated to be realized with the project in place, as compared to the future without project condition. The project will reduce maintenance dredging requirements from a projected 54 million cubic yards without the project to about 13 million cubic yards with the project in place. At the 54 million cubic yards level of dredging, we would be unable to maintain a 40-foot project depth, whereas, at the 13 million cubic yard level of maintenance dredging we would be able to maintain a 40-foot project depth about 90 percent of the time. This translates to an annual savings of $74,400,000 at the current discount rate of $8\frac{7}{8}$ percent. The other form of savings relates to reduced transportation costs that would be experienced by the shipping industry. As the Corps' ability to maintain a 40-foot project depth decreases, transportation costs increase as a result of light loading and more frequent trips and possible off-loading to smaller vessels. When compared to maintaining the project depth 90 percent of the time, this annual savings approximates $528 million at the current discount rate of $8\frac{7}{8}$ percent.

## SOUTHWEST PASS

Senator JOHNSTON. What is your capability in the Southwest Pass, General Sands? How does that compare with the budget?

General SANDS. That capability would be $49 million. As I indicated in the presentation, that we are in the process of moving that particular program to our "Operation and maintenance" account. With the effort that is going on in Southwest Pass right now, to rehabilitate the bank line, basically, it is to enable us to effectively maintain the navigation channel.

So after fiscal year 1988, the funds for that particular effort will be within our "Operation and maintenance" account.

Senator JOHNSTON. You have a capability of $40 million?

General SANDS. No; $49 million.

Senator JOHNSTON. OK. $49 million, but there is $23 million in the budget; is that correct?

General SANDS. Yes, sir; there is an additional $49 million, for a total of $72 million.

Senator JOHNSTON. Why is funding being shifted to the "Operation and maintenance" account?

General SANDS. This decision is based on the fact that the major impetus for accomplishing the work is to avoid large future maintenance dredging cost increases. The reason for construction of the project is to allow the Corps to more easily maintain the authorized project dimension.

Senator JOHNSTON. Will this enhance project completion in your professional opinion?

General SANDS. That is difficult to say. As you are aware, the Water Resources Development Act of 1986, Public Law 99–662, provides ceilings on funds which can be appropriated for construction in various fiscal years. Funding this work under the "Operation and maintenance" account would mean that it would not have to compete with other projects for funding within the mandated construction ceiling. However, this work will have to compete with other maintenance work within the "Operation and maintenance" account. This change will require a substantial increase in the "Operation and maintenance" account for this project until the bank line is restored.

## WEST JEFFERSON, LA., HURRICANE PROTECTION

Senator JOHNSTON. What plans does the Corps have for hurricane protection in West Jefferson Parish in Louisiana?

General SANDS. Sir, the Water Resources Development Act of 1986, Public Law 99–662, approved November 17, 1986, authorized a hurricane protection project for this area. The feasibility report was submitted to the Board of Engineers for Rivers and Harbors on February 4, 1987. The report recommended that improvements for hurricane protection on the West Bank Jefferson Parish be implemented as a federal project. The plan would generally consist of levees and floodwalls along an alignment that incorporates a levee alignment previously permitted by the Corps for construction by the West Jefferson Levee District in the area between Westwego and Harvey Canal. Additional study is also being continued for selected remaining areas.

Senator JOHNSTON. What is the cost of this plan of protection and how much is included in the 1988 budget?

General SANDS. The total first cost of the plan is estimated to be $62,600,000 at October 1986 price levels. The budget request of $500,000 would be used for continuation of the study of the remaining areas. Funds for the initiation of planning, engineering, and design are not included in the fiscal year 1988 budget request since the study had not progressed sufficiently at the time the budget was developed.

## WEST JEFFERSON HURRICANE PROTECTION, LOUISIANA

Senator JOHNSTON. What is your capability on the West Jefferson hurricane protection project?

General SANDS. That is $1 million for preconstruction engineering and design, sir.

Senator JOHNSTON. How much is in the budget for that?

General SANDS. There is nothing in the budget for preconstruction engineering and design for hurricane protection in the Westwego Harvey Canal area.

Senator JOHNSTON. Nothing in the budget.

Provide a funding profile to initiate work in 1988 through completion.

General SANDS. Total cost for this project is estimated to be $62,600,000, October 1986 price levels, of which $40,700,000 is federal cost. A funding profile based on an engineeringly feasible and efficient design and constructing schedule is as follows:

| *Fiscal year* | *Funding requirement* |
|---|---|
| 1988 | $1,000,000 |
| 1989 | 1,000,000 |
| 1990 | 6,000,000 |
| 1991 | 13,000,000 |
| 1992 | 10,000,000 |
| 1993 | 2,500,000 |
| 1994 | 2,000,000 |
| 1995 | 1,500,000 |
| 1996 | 1,000,000 |
| 1997 | 300,000 |
| 1998 | 1,800,000 |
| 1999 | 500,000 |
| 2000 | 100,000 |
| Total | 40,700,000 |

## ATCHAFALAYA BASIN—LAND ACQUISITION

Senator JOHNSTON. Would you tell me about the status in the Atchafalaya basin land easements and fee title? What is judgment on which direction to go on that?

General SANDS. Yes, sir; I would be happy to.

Senator, as I indicated earlier, there are three elements within the Atchafalaya basin area that was recommended in the Atchafalaya basin land and water resources study for additional acquisition.

One was for flood control easements on some 89,000 acres. This is an area where we currently have the authority to acquire the flood control easements, but we currently acquire them only on a claim basis. That is basically those areas that did not flood during the 1927 flood.

Additional acquisitions are required for flood control purposes. These were developmental control easements. This was necessary on some 300,000-plus acres within the Atchafalaya basin. This was basically an effort to preclude the development of homes within the area.

The third was an environmental easement on, basically, the same acreage within the basin, and that was designed to prohibit land use changes within the basin. As it stands right now, our real estate design memorandum is moving toward acquiring those elements within that particular plan to have a direct impact on flood control. Those would be to go ahead and purchase the flowage easements over the 89,000 acres and the developmental control easements.

Senator JOHNSTON. The 89,000 acres are the acres that did not flood?

General SANDS. Basically.

Senator JOHNSTON. That is 89,000?

General SANDS. Yes, sir.

Senator JOHNSTON. Those flood virtually every year right now, don't they?

General SANDS. Not every year, sir, but 1 out of 7 years you can probably count on relatively high water in that area.

Senator JOHNSTON. Is there anything additionally you were doing that would make those flood more than they do right now?

General SANDS. No, sir.

Senator JOHNSTON. So that whatever is happening to those 89,000 acres is happening and has been happening for how many years?

General SANDS. Ever since we built or designed the Atchafalaya floodway, basically.

### HISTORICAL NOTE

Senator JOHNSTON. When was that completed?

General SANDS. That work, initiated in the late twenties, is still ongoing. The Old River Control Structure went in in 1963. Prior to that point in time, it was open flow. But certainly, those 89,000 acres, if we were to have a project design flood tomorrow, they would flood.

Senator JOHNSTON. If you didn't have the Atchafalaya project, would those flood, as well, today?

General SANDS. That would be a matter of speculation, Senator, but my guess is that they would certainly flood today.

Senator JOHNSTON. So I would think that the acquisition of those 89,000 acres would be not the highest priority along the Atchafalaya.

General SANDS. Sir, as I indicated, we already have the authority to acquire those flowage easements, and we have done so strictly on a claim basis. If we flooded one of the landowners and he came in with a claim, then certainly, we would acquire a flowage easement. We have paid claims on some 11,000 acres within that area, as I recall. When we looked at this particular effort to determine whether or not there were any additional real estate interests within the basin over which we would acquire additional easements, part of the recommendation was since we were going to acquire additional easements, rather than continue to pay the flood control easements on a claim basis, we would go out and make a one-time purchase.

### ALEXANDER AND PULASKI COUNTIES, ILL.

Senator JOHNSTON. Why was only $200,000 of the $400,000 that was requested and appropriated for the Alexander-Pulaski Counties, Ill., study allocated for the current year as planned?

General SANDS. The $400,000 requested and appropriated in fiscal year 1987 for this study was for the total effort to initiate the feasibility phase of the study at total federal expense. The enactment of the Water Resources Development Act of 1986 requires that the feasibility phase be cost shared with nonfederal interest contributing 50 percent of the cost. The $200,000 federal funds represents the federal share of this effort for fiscal year 1987. We are in the process of developing a local cooperation agreement which will provide for a 50-percent contribution to the study effort by the local sponsor.

### ADDITIONAL QUESTIONS SUBMITTED FOR THE RECORD

Senator JOHNSTON. That is fine. General Sands, Senator Sasser and Senator Bumpers have submitted some questions for your response. I'll include those in the record at this point.

[The questions and answers follow:]

### QUESTION SUBMITTED BY SENATOR SASSER

### BOAT-LAUNCHING RAMP—MISSISSIPPI RIVER, LAUDERDALE COUNTY, TENN.

*Question.* What is the problem related to access to the Mississippi River? What is the Corps fiscal year 1988 capability on this project?

Answer. There is presently no adequate, safe access for small recreation and commercial fishing boats along this reach of the Mississippi River in west Tennessee.

The Tennessee Wildlife Resources Agency requested by letter of February 17, 1987, that the Corps of Engineers assist in building a boat ramp in Lauderdale County, downstream of the mouth of the Obion River. This facility would be built under the authority provided by the Federal Water Project Recreation Act of 1965, Public Law 89-72. The Memphis District has initiated the required design and feasibility studies and will submit a report on the matter. Construction of the boat ramp could be initiated in fiscal year 1988 within funding requested for the channel improvement project under the Mississippi River and tributaries appropriation, subject to development and approval of a local cooperation agreement with a local sponsor. The local sponsor would be required to provide lands, easements, and rights-of-way; contribute 50 percent of the cost of construction; and agree to operate and maintain the facilities after construction.

## QUESTIONS SUBMITTED BY SENATOR BUMPERS

### HELENA HARBOR, ARKANSAS

Question. What is the Army Corps of Engineers' financial capability to perform work at the Helena Harbor project in Phillips County, Arkansas during the remainder of this fiscal year?

Answer. With limited Federal funds which are available in the face of large budget deficits, difficult choices have had to be made to allocate our resources to the construction of higher priority projects for flood control and deep draft commercial navigation. Should Congress provide the necessary funds and direct us in Appropriation Act language to proceed with the Helena Harbor project, $300,000 could be utilized to initiate Preconstruction Engineering and Design studies. Detailed hydrographic surveys must be obtained early in the process, and these funds could be utilized to contract for those services as well as begin the other detailed engineering, economic, and environmental studies needed.

Question. What is the capability of the Corps to perform work on the Helena Harbor project in Fiscal Year 1988?

Answer. Funds in the amount of $500,000 could be utilized in Fiscal Year 1988 to continue Preconstruction Engineering and Design studies.

### SLACK WATER HARBORS

Question. Does the Administration support Federal involvement in the construction of the harbor projects located at Greenville and Vicksburg, Mississippi, Memphis, Tennessee, Olcott, New York and St. Louis Missouri, all of which are authorized in the Water Resources Development Act of 1986 along with Helena Harbor?

Answer. As stated previously, within the severe budget constraints under which we are operating, we are striving to allocate our resources to the construction of higher priority projects for flood control and deep draft commercial navigation. Federal participation in inland waterway harbor improvements under the Army Civil Works Program is not considered warranted when resale or lease of lands used for disposal of excavated channel material can recover the cost of the improvements or the acquisition of land outside the navigation servitude is necessary for construction of the improvements and would permit local interests to control access to the project. In the first case, local financing should be possible using anticipated income from the sale or lease of the enhanced lands, and in the second case, from anticipated charges for access to the improvements. In these circumstances, it is considered that local sponsors should construct the improvements and recover their costs from the sale or lease of lands enhanced by the projects.

### YELLOW BEND, ARKANSAS, PORT

Question. During FY 1986 and again in FY 1987 the funds requested for the Section 107 Small Harbors discretionary fund included amounts specified by the Chief of Engineers and identified in official documents such as the "President's budget request" for construction of a project at Yellow Bend in Desha County, Arkansas, on the Mississippi River. This occurred even though the policy directive from the Assistant Secretary's Office indicates that there will be no Federal interest in this project. You have had an investigator in Desha County twice in recent weeks. Have you now determined that there is Federal interest in this project?

Answer. The Yellow Bend Port Project is currently being reconsidered by the Assistant Secretary of the Army for Civil Works in light of the current policy on Federal participation in port projects and as a possible exception to this policy. A representative of the Assistant Secretary's Office who is reviewing this project recently toured the project area and met with local interests and Corps officials. His findings are to be submitted directly to the Assistant Secretary's Office for consideration. To date we have received no further guidance from the Assistant Secretary's Office concerning this project.

## MISSISSIPPI RIVER PORTS AND HARBORS

Question. The U. S. Coast Guard has figures that indicate that during the period from September 1980 until now 6400 incidents have occurred on the Mississippi River that have resulted in $154,000,000 in damages and the lost of 38 lives. Of this total, 1600 incidents occurred in the fast water harbors of St. Louis, Baton Rouge and New Orleans. These incidents resulted in $59,000,000 in damages and 11 lost lives. During this same time period only four incidents occurred at slack water harbors on the lower Mississippi River resulting in an estimated $550,000 in damages and no lost lives. In view of these statistics why are you taking the position of encouraging the development of fast water ports and discouraging slack water harbors.

Answer. The Corps does not encourage or discourage either fast water ports or slack water harbors. If properly planned, designed and constructed, either type facility can function efficiently. From an operational standpoint, slack water harbors do offer certain safety advantages. Slack water ports are more often desirable by local interest, but are normally more costly. The question is not so much slack water versus fast water but who should pay for the facility. In consonance with current Corps policy, Federal participation is not warranted when resale or lease of lands used for disposal of excavated channel can recover the cost of the improvements, or where land outside the navigation servitude is necessary for construction of the improvements and would permit local interests to finance the project cost from charges for access to the improvement. Where the above circumstances exist, it is appropriate for non-Federal interests to implement the proposed improvement in responses to local market conditions.

Question. Are you aware that insurance premiums for facilities located directly on the river as opposed to those located in slack water harbors contain an approximate 20 percent surcharge, thereby making fast water facilities even more economically unfeasible?

Answer. We are aware that insurance premiums for facilities located directly on the river are higher than for similar facilities in a slack water harbor. The cost of insurance is a valid consideration but represents only a small portion of the operational cost of a harbor facility. These costs are directly reflected in our analyses of harbor projects in the fees charged by the port for transfer and handling of goods and commodities. The varying rates of insurance, considered by themselves, would not have significant impacts on the economics of a project.

## HELENA HARBOR AND YELLOW BEND PORT

Question. What does this committee have to do to ensure that the harbors, which you have led the people of Phillips County and Desha and Chicot Counties to believe will be constructed by the Federal government, will actually be constructed beginning this year?

Answer. As stated previously, with the limited Federal funds which are available in the face of large budget deficits, we are striving to allocate our resources to the construction of higher priority projects for flood control and deep draft commercial navigation. Because of our policy toward Federal participation in inland waterway harbor improvement where non-Federal interests can recover the cost of improvements, the Department of Army will allot funds to such projects only when the funds are included in the Appropriation Act language. However, any money spent on these projects would mean that some other project which we feel is more deserving of taxpayers' limited funds will not proceed as quickly.

## DEGRAY LAKE WATER SUPPLY

Question. For several years now negotiations have been underway between the Ouachita River Water District, the City of Little Rock and the Corps to provide for the use of Lake DeGray as a water supply for the city. Numerous stumbling blocks have been encountered which have delayed a final agreement, including recent changes in the Corps' payback policy and the Corps' unwillingness to let the Ouachita Water District have the exclusive right to market the water and contract directly with the City or to allow the Water District to have the right of first refusal on a Corps contract. Recent meetings of the parties involved have brought up the question of whether language included in the 1986 Water Resources Development Act would be prospective or retrospective with regard to interest rate and debt repayment terms. Can you bring me up to date on the status of these negotiations?

Answer. We have found sufficient flexibility in the application of Public Law 99-662 to allow us to recognize ongoing negotiations and commitments which have been made. In view of those findings, we have prepared a draft Memorandum of Agreement, which provides a right-of-first-refusal to the Water District and provides for the sale of storage from the regulating basin at DeGray Lake at prices established in accordance with policies existing prior to passage of Public Law 99-662. However, in consideration, we would expect the Water District to begin making annual payments to cover the operation and maintenance costs of the project allocated to water supply. As an alternative, the Assistant Secretary of the Army is willing to provide without consideration a right-of-first-refusal to the Water District which would provide for the sale of storage using policies in effect at the time of contract negotiations. This could possibly result in pricing storage in a manner more consistent with Public Law 99-662. These options were passed on to the Water District in a letter from the Assistant Secretary's Office sent out 6 March 1987.

## CLOSING REMARKS

Senator JOHNSTON. I want to thank you very much for your testimony and to commend you and your excellent staff for keeping Louisiana, for the most part, high and dry. Without the Corps, we would be very wet, indeed. I don't know that they would be having the Mardi Gras down there in the French Quarters if it weren't for the Corps of Engineers. So we appreciate the Corps and thank you for your good work.

Thank you very much.

General SANDS. Thank you very much.

Senator JOHNSTON. The subcommittee will take a short recess before calling the New England Division.

[A short recess was taken.]

## NEW ENGLAND DIVISION

### STATEMENT OF COL. THOMAS A. RHEN, DIVISION ENGINEER

ACCOMPANIED BY:

WILLIAM C. SCULLY, CHIEF, PROGRAMS MANAGEMENT OFFICE

ROBERT H. BYRNE, JR., ASSISTANT CHIEF, PROGRAMS MANAGEMENT OFFICE

### INTRODUCTION OF ASSOCIATES

Senator JOHNSTON. The hearing will come to order.

Colonel Rhen, we are very pleased to have you. If you would introduce your staff and proceed as you wish?

Colonel RHEN. Thank you, Mr. Chairman.

It is indeed a pleasure for me to appear before your committee and report on our Division status today. With me are Mr. William Scully on my right, our Chief of Programs Management, and Mr. Bobby Byrne, who is his assistant, on my left.

With your permission, sir, I would like to briefly highlight for you some of this past year's activities and then present our budget request for fiscal year 1988.

### AREA OF RESPONSIBILITY

The New England Division has civil works responsibility for the six-state New England region, exclusive of the western half of Vermont. This is an area of some 66,000 square miles that is home to some 12 million people. The Division is headquartered in Waltham, Mass., just west of Boston.

This past year has been a very busy and a very satisfying one. The current year holds promise for the same.

### NEW LONDON, CONN.

On August 1, I participated with Governor O'Neill and Mayor Kanzler in the dedication ceremony for the completed hurricane protection project at New London, Conn. As perhaps a forerunner of what we are seeing in today's unfolding success story of increased nonfederal cost sharing, it is worthy to note that local interests contributed 30 percent to this project.

### WARWICK, R.I.

In the same vein, we have completed the nonstructural flood control project for the Belmont Park section of Warwick, RI. Removal of 60 chronically flood-prone homes was completed, as was the construction of utility room additions to 15 other homes that suffer primarily basement flooding. Local interests contributed 20 percent of the cost of this project.

## KEENE, N.H.

In early November, we dedicated the Beaver Brook local protection project in Keene, N.H. Constructed to protect portions of Keene from flooding as seen here in 1984, this $2.3 million project was accomplished under the section 205 continuing authority. I might note that our contractor completed this project fully one year ahead of schedule.

The continuing authorities program continues to be very active and an important aspect of fulfilling the water resources needs of the region. In addition to completing the Warwick and Keene projects, we have awarded nine construction contracts in this past year.

## ROCKPORT HARBOR, MASS.

The first of these involved dredging which is currently underway to improve the harbors at Rockport, Mass. This navigation project will provide much-needed additional anchorage space for the very crowded, predominantly commercial small boat fleet in this, one of New England's most picturesque harbors.

## EMERGENCY STREAMBANK AND SHORELINE PROTECTION PROJECTS

The other eight contracts were awarded last summer for emergency streambank and shoreline erosion protection projects. These kinds of projects protect highways, bridges, schools, and other nonprofit public services. The region's exposed coastline and steep, flash-flood type rivers and streams create a large demand for this kind of protection.

Projects at Burrillville, R.I., and Conway, Mass., have already been completed. Work is ongoing at Milford, Conn.; Sheffield, Mass.; in Machias, Ogunquit and Perry, Maine, and at Brownsville, Vt.

This is a view of the erosion along the South River in Conway, Mass., prior to our project; and here is a view of the completed project in place.

## FEASIBILITY AND DESIGN WORKLOAD

The magnitude of our continuing authorities program workload is reflected by this slide. This covers the planning and engineering items. As you can see, we currently have 54 items which are active in the study on the final design stage.

During this past year, we have terminated further activity on two proposed navigation improvements for which we have concluded a lack of economic justification to warrant further federal participation.

Our studies of the feasibility of deepening the existing deep-draft channel in the Fore River at Portland Harbor, Maine, have determined that the costs outweigh the benefits.

Also, an update of the projected benefits for the authorized Bristol Harbor, R.I., project, accomplished during preparation of the general design memorandum, have determined a lack of sufficient benefits to justify construction of a protective breakwater.

We in the Division, along with the water resources people of the region, as I am sure is true across the rest of the country, are genuinely encouraged by the enactment of the Water Resources Development Act of 1986.

Four of the five major projects in New England authorized for construction by this act are currently funded and appear in the 1988 budget, two for preconstruction engineering and two for construction funding. Beyond these, the act authorizes several other projects and programs that are important to meeting the challenges of the water resources needs of the people of the region.

Our past experience in New England, as well as our current discussions with project proponents and sponsors, indicates that cost sharing will, indeed, work.

Turning for a moment to the current fiscal year, we expect to initiate construction on four major projects. All four will be cost shared in accordance with the provisions of the recently enacted Water Resources Development Act.

## JONESPORT HARBOR, MAINE

The first, to be awarded this spring, will be the navigation project at Jonesport Harbor, Maine. A fiscal year 1985 supplemental new start, this project will provide a much-needed breakwater and anchorage for this northern Maine community that is heavily dependent upon its commercial fishing fleet.

The need for this project was again demonstrated in early December, when storm-driven waves sank one boat, damaged others at their moorings, and battered shorefront wharves and piers.

## REVERE BEACH, MASS.

The Revere Beach, Mass., shore protection project is one of three fiscal year 1987 new starts. The placement of sandfill along the more than 2 miles of beach will protect the seawalls and floodwalls that are being seriously undermined by wave action.

Scheduled to start this summer, the project will help prevent the overtopping and flooding as seen here in 1978 and repeated during a storm in January 1987.

## PORTSMOUTH HARBOR AND PISCATAQUA RIVER, N.H.

Also starting this summer will be the improvement dredging to the deep-draft Piscataqua River channel at Portsmouth Harbor, N.H. The $19 million project will widen the existing 35-foot-deep channel in three critical areas to improve what are now serious navigational hazards in this waterway.

### TOWN BROOK, QUINCY, AND BRAINTREE, MASS.

The final construction start this summer will be the Town Brook local protection project in Quincy and Braintree, Mass. This $30 million project is intended to alleviate frequent, damaging flooding in a highly urbanized area just south of Boston.

The major project feature will be a 12-foot-diameter tunnel almost 1 mile long that will be constructed some 150 feet below the city of Quincy.

### FISCAL YEAR 1988 BUDGET REQUEST

I would like to now address our fiscal year 1988 request. A breakdown of the budget dollar looks like this, with the construction request accounting for 46 percent and operation and maintenance for 50 percent.

In terms of dollars, the total budget request is $45.3 million. In summary, it looks like this. I will briefly highlight each category.

The budget request of nearly $1.6 million for general investigations includes funds to initiate two reconnaissance studies and to continue three feasibility studies.

The two new starts are for the Ashuelot River and the Mascoma River flood control studies in New Hampshire, which were requested following serious flooding in 1984.

### SOUTHEASTERN NEW ENGLAND COMPREHENSIVE STUDIES

The largest study item is for the continuing investigation of solutions to coastal flooding problems in the eastern Massachusetts area being accomplished under the southeastern New England study.

Last year's justification sheet indicated a then-changing direction to this study. This was toward a possible common solution to what we were finding was significant flood potential not only to the city of Revere, but to the adjoining communities of Lynn, Saugus, and Malden.

We have now gathered more detailed historic damage information and developed more definitive hydrologic data. A gated barrier project at the mouth of the Saugus River to serve as a comprehensive solution to the flood problems of these four adjoining communities is emerging as a viable alternative to individual dike and wall projects.

We are seeing increased and broad-based support for the gated barrier, which appears to have a higher benefit payback and less environmental impacts than a combination of other structures.

The study cost estimate has increased $1.2 million to evaluate the feasibility of these additional alternatives.

These are scenes from storms this winter which, while not as significant or as serious as the historic 1978 blizzard event, have served to fortify the concerns of the communities. These recent storms have also provided us with valuable additional data.

### PRECONSTRUCTION ENGINEERING AND DESIGN

The general investigation request also provides for continuing preconstruction engineering and design for two projects authorized by the Water Resources Development Act of 1986.

These are the Roughans Point flood control project in Revere, Mass., and the New Haven Harbor, Conn., deep-draft navigation improvement.

### CONSTRUCTION, GENERAL

The $21.1 million construction, general request will provide for the continuing construction of four projects I discussed a few moments ago. These are: Jonesport Harbor, Maine; Portsmouth Harbor/Piscataqua River in New Hampshire; Revere Beach in Massachusetts; and Town Brook, Mass.

### OPERATION AND MAINTENANCE

The O&M program request of $22.6 million is a decrease of approximately $1.1 million from the fiscal year 1987 program level. It will, however, allow us to adequately address our priority O&M program requirements.

A total of $8.8 million will be used for navigation, including the dredging of one project and operation of the Cape Cod Canal. A total of $10.8 million will be used for flood control, providing for the operation and maintenance of 31 reservoirs and 2 hurricane barriers; and $3 million will be used for regulatory functions.

### REGULATORY PROGRAM

Our regulatory program continues to be a demanding one upon my staff despite the presence of nationwide and state general program permits.

This chart summarizes permit program activity for the past 5 fiscal years. As you can see, the number of applications received have steadily increased, and markedly so this past year. Despite increased manpower dedicated to this activity, you will note that the progress we were making in terms of backlog and average processing time has been temporarily reversed. This is of real concern, and we are employing every conceivable innovative management technique to overcome this problem.

### DIVISION RECOGNITION AWARDS

I would like to close by sharing with you some of the rewarding aspects of this past year. The New England Division was honored to receive awards in two separate competitions.

Our Cape Cod Canal project was selected by the Chief of Engineers as the Corps of Engineers' project of the year. The award cited the efficiency and innovation shown in the management of the entire facility.

The widest sea-level canal in the world, this 17.4-mile-long waterway is vital to deep-draft commercial shipping. An advanced, computerized system for monitoring marine traffic incorporates radar, closed-circuit television, and radio communications to provide a high degree of safety around the clock.

The project is also operated as one of New England's outstanding facilities for public recreation use. Visitors to the project enjoy both the land and the water areas for fishing, saltwater swimming, picnicking, overnight camping, or just relaxing and watching the vessels pass through the canal. Last year's visitation was approximately 2.5 million.

We are also proud to have had two New England Division candidates selected among the five Corps winners in the Take Pride in America Campaign. These awards recognize the care we take in managing the natural resources under our stewardship. One of the awards went to one of our park rangers, Miss Joan Cyr, who, for the past 8 years has overseen the recreation and resource management activities for nine resevoir projects in the Thames River basin. During the past 2 years, she initiated, fostered, and implemented five programs designed to increase public awareness of and responsibility for Corps lands, facilities, and activities and promote the safe and conscientious use of Corps waters.

These special programs were carried out in addition to a regular workload through dedication, perseverance, and the ability to involve the talents of other individuals.

The other Take Pride Award recognized a group of citizens who are members of the National Campers and Hikers Association. This organization is devoted to promoting outdoor recreation with a strong commitment to improving any area they visit. A camping visit in 1981 to our West Thompson Lake project has led to a 5-year partnership with the Corps. This past May, some 20 members of three separate chapters of this group returned for their fifth annual cleanup and camporee. For 5 days, they worked with our park rangers to put in 500 hours of volunteer service in preparing the campground for its seasonal opening.

Thanks to this partnership in caring, the campground is open annually in no less than perfect condition. It is with this pride that we in the New England Division will continue to vigorously pursue our civil works program.

I look forward to working with you and the committee in the months ahead in addressing the water resource needs of the New England region.

Mr. Chairman, this concludes my status report. I would be pleased to answer any questions.

### GROWTH IN CONSTRUCTION PROGRAM

Senator JOHNSTON. Thank you very much, Colonel Rhen.

The construction program of the New England Division has gone from about $5.5 million in 1987 to $21.1 million in 1988. Does an increase of this size present any problems, any difficulties for you in your Division?

Colonel RHEN. No, sir; it does not.

## ENGINEERING CAPABILITY

Senator JOHNSTON. Do you have sufficient engineering manpower to execute a program of the size proposed in the fiscal year 1988 request?

Colonel RHEN. Yes, sir. For the four projects involved in the major construction program increase that you have cited, much of the engineering has already been accomplished during the past several years. For the Jonesport Harbor project, for instance, all preconstruction engineering has been completed. We are ready to go to bid.

For the Portsmouth Harbor and Revere Beach projects, we have completed the general design memorandums. Only the contract plan and specifications need to be completed before we are ready to go out to bid on those two projects.

The Town Brook project is the most complex of the four, but, again, our engineering effort is well along. All but one of the design memorandums are completed, as of now, and the plans and specifications for the initial construction contract are more than 50-percent complete.

We fully expect to have all four projects under construction in the current year.

## FUTURE DIVISION WORKLOAD

Senator JOHNSTON. The four construction projects are new activities having been initiated as the result of the 1985 supplemental or the 1987 Energy and Water bill. What happens to the New England Division after 1990 when most of this work is completed? You do not appear to have much coming in the study phase either.

Colonel RHEN. There are still significant water resources needs remaining in the New England region, and I expect the Division's program to remain healthy. There are other items in the fiscal year 1988 budget request that may well be ready for construction in the 1990 timeframe or soon thereafter.

The Roughans Point storm damage reduction project in Revere, Mass., is currently in the preconstruction engineering and design phase. That effort is scheduled for completion at the end of fiscal year 1989. The project was authorized for construction in the Water Resources Development Act of 1986.

We also have a major study effort underway in the southeastern New England study that is investigating solutions to a significant problem of coastal storm damage and flooding in several communities just north of Boston. A $40 to $50 million gated barrier structure to protect portions of the communities of Revere, Lynn, Saugus and Malden is being investigated in detail. The study is expected to be completed in mid-1990.

Another ongoing study included in the budget is evaluating solutions to the flooding problems of one of the region's most flood-susceptible cities. The Connecticut River basin authorization reports study will recommend solutions to the flood threat to the western Massachusetts city of Westfield. A local protection project appears to be well justified and is being supported by local officials. This study is scheduled for completion at the end of calendar year 1988.

We have also just initiated the preconstruction engineering and design effort for the deepening and widening of the deep-draft channel into the major port of New Haven, Conn. This project was also authorized for construction by the Water Resources Development Act of 1986.

There is the west central Connecticut coastal flooding study that has been started this year and the two new study starts in the fiscal year 1988 budget—the Ashuelot River and Mascoma River flood control studies in New Hampshire. Projects may evolve from these, but, of course, that is an unknown at this time.

I would also expect the continuing authorities program to continue to be quite active in meeting a significant portion of the region's needs. In addition, there were several items included in Public Law 99-662 that we will consider in formulation of our future budget requests. So yes, I am optimistic about the Division's future workload.

### STATUS OF COST SHARING FOR JONESPORT HARBOR PROJECT

Senator JOHNSTON. What is the current status of the local cost-sharing agreement on the Jonesport Harbor project in Maine?

Colonel RHEN. Sir, the cost-sharing agreement has been signed, and the reason that we have not gotten into construction is because locals are still working out their funding for this cost-sharing agreement.

Senator JOHNSTON. Is the providing of the nonfederal cost sharing of this project through the use of the federal Community Development Block Grants and FHA loans, in accordance with Public Law 99-662?

Colonel RHEN. Yes, sir; it is my understanding it is.

### ITEMS OF LOCAL COOPERATION

Senator JOHNSTON. The justification material sets forth numerous additional items that the local interests must accomplish for which there is no estimated cost. Could you explain this situation?

Colonel RHEN. The additional items noted in the justification sheet have no estimated cost because any costs associated with providing these items are expected to be negligible. Construction of the Jonesport project will not require any lands, rights-of-way or relocations. Some temporary easements during construction and maintenance will be required. The town has already completed the public landing, in anticipation of the project. The remaining items involve regulating the use of the harbor in accordance with the laws and policies governing federal navigation projects.

Senator JOHNSTON. Do you have any idea if these items will be provided as required? Is there a schedule for local interests to complete this work?

Colonel RHEN. I fully expect all of the required items to be provided. As for the schedule, local interests must provide the temporary easements prior to initiation of construction and I don't forsee any problems there. As I mentioned earlier, the public landing in Sawyer Cove has already been constructed. The regulations and policies governing use of the harbor facilities should be in place once project construction is completed.

Senator JOHNSTON. Is use of the $4,340,000 budget request for fiscal year 1988 contingent upon locals agreeing to and/or accomplishing any of this work? Please explain.

Colonel RHEN. Yes, sir; it is to some extent. Locals have already agreed to these items with the signing of formal assurances on June 16, 1986. The only remaining items of work on their part is providing the temporary easements which I expect in the next couple of months.

### ADDITIONAL PREPARED QUESTIONS SUBMITTED FOR THE RECORD

Senator JOHNSTON. Colonel Rhen, we have some other questions which we will place in the record for your response. That is all I have at this time. Thank you very much for an excellent presentation.

Colonel RHEN. Thank you, Mr. Chairman.

[NOTE: The following questions were not asked, but were placed in the record for response by the Corps.]

### WATER RESOURCES DEVELOPMENT ACT OF 1986

Senator JOHNSTON. Briefly, what is in Public Law 99-662 for your area of responsibility and how do you see those projects moving into future budgets?

Colonel RHEN. Public Law 99-662 contained quite a few items for the New England Division area. Briefly, I would divide them into two categories—major project construction authorizations that resulted from our previously completed feasibility studies, and then studies or projects that are new to us.

Five major projects were authorized for construction. These include the Portsmouth Harbor and Town Brook projects that are already funded for construction initiation. The Roughans Point storm damage reduction project in Revere, Mass., and New Haven Harbor, Conn., navigation project are also in the budget to continue preconstruction engineering and design. The fifth project, the Big River multiple-purpose dam and reservoir project in Rhode Island, has not yet been budgeted or funded to continue.

The act authorized planning, engineering and design of flood control work in Brockton, Mass., and of navigation improvements for the Merrimack River from Lowell to Lawrence, Mass., and for the Neponset River from Milton Town Landing to Port Norfolk, Mass. Reconnaissance and feasibility studies for extending navigation on the Merrimack River from Lawrence to Haverhill, Mass., and then on to the mouth of the Merrimack River, as well as a study on the impacts to the United States of potential Canadian tidal power development in the Bay of Fundy were also authorized.

Other items include the removal of the center span of the India Point Railroad Bridge over the Seekonk River in Providence, R.I.; the removal of silt and aquatic plant growth in Gorton's Pond, R.I.; and the construction, operation and maintenance of facilities at our Townshend and Ball Mountain Dams on the West River in Vermont to enable Atlantic salmon migration. The Gorton's Pond and West River projects are subject to review and comment by the Assistant Secretary of the Army.

Also authorized was a cropland irrigation and conservation research and demonstration program for increasing potato yield in Maine's Aroostook County.

These studies and projects will be considered along with our other activities in developing our fiscal year 1989 and future budget requests.

### PORTSMOUTH HARBOR, N.H.

Senator JOHNSTON. Specifically, why has only $600,000 of the $3,000,000 requested and appropriated for the Portsmouth Harbor project in New Hampshire been used as provided for by Congress?

Colonel RHEN. The $600,000 represents the amount we now feel we can effectively utilize in fiscal year 1987. A total of $117,000 was assigned to the project in savings and slippage, and the remaining difference, roughly $2.3 million, was transferred back to our headquarters.

Two factors have brought this about. First, passage of the Water Resources Development Act, necessary for both project authorization and cost-sharing legislation, took somewhat longer than anticipated. Second, we are finding it a little more time consuming than expected to complete the local cooperation for the new starts, in particular the arrangements for the nonfederal financing.

Senator JOHNSTON. The current nonfederal cost of the project estimated at $6,615,000 but the justification material sets forth numerous additional items that the local interest must accomplish for which there is no estimated cost. Could you explain this situation?

Colonel RHEN. Yes, sir. This situation is similar to the Jonesport one I just outlined in the costs associated with the additional items are negligible. There are no lands, easements, rights-of-way or relocations associated with project construction or maintenance. There is no requirement to provide a disposal area at this time as we now plan to dispose of the material at sea. This would also eliminate any special local benefits derived from use of the disposal material. Providing and maintaining adequate depth in the berthing areas and local access channels does not have an estimated cost since depths are currently sufficient and future maintenance is not expected to be a significant item.

Senator JOHNSTON. Is use of the $7.5 million budget request for fiscal year 1988 contingent upon locals agreeing to and/or accomplishing any of this work? Please explain.

Colonel RHEN. Use of the funds requested for fiscal year 1988 are contingent upon locals signing a formal local assurance agreement for the items outlined in the justification sheet and providing the required nonfederal financing. As I mentioned earlier, there is no specific work to be accomplished by locals.

Senator JOHNSTON. Has the state of New Hampshire indicated any reluctance in providing these assurances and funding?

Colonel RHEN. No, sir; they have not. The state has been supportive of the Portsmouth project all along. The Governor has indicated, by letter, the state's intent to execute an agreement to meet the requirements of local cooperation. We are in the process of negotiating this agreement with them.

## SUBCOMMITTEE RECESS

Senator JOHNSTON. The committee will stand in recess until 10 a.m. on Thursday.

(Whereupon, at 10 a.m. Tuesday, March 3, the subcommittee was recessed to reconvene at 10 a.m. Thursday, March 5.]

# ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 1988

THURSDAY, MARCH 5, 1987

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
*Washington, DC.*

The subcommittee met at 10:10 a.m. in room SD-192, Dirksen Senate Office Building, Hon. J. Bennett Johnston (chairman) presiding.

Present: Senators Johnston, Sasser, and Specter.

## DEPARTMENT OF THE ARMY—CIVIL

### CORPS OF ENGINEERS—CIVIL

### NORTH ATLANTIC DIVISION

### STATEMENT OF BRIG. GEN. CHARLES E. WILLIAMS, DIVISION ENGINEER

**ACCOMPANIED BY:**
- **EDWARD NAUGHTON, CHIEF, PROGRAM DEVELOPMENT OFFICE**
- **NEIL STUART, DEPUTY CHIEF, PLANNING DIVISION**
- **EUGENE BRICKMAN, ENGINEERING DIVISION**

### INTRODUCTORY REMARKS

Senator JOHNSTON. The subcommittee will come to order.

This morning, we are directing our attention again to the fiscal year 1988 budget for the Army Corps of Engineers.

We are pleased to have with us Brig. Gen. Charles E. Williams, Division Engineer for North Atlantic Division; Brig. Gen. Robert H. Ryan, Division Engineer for the Pacific Ocean Division; and Maj. Gen. Henry J. Hatch, Director for Civil Works to cover the remaining items of the fiscal year 1988 civil works budget.

General Williams, we will call on you as our first witness. If you would introduce your staff and proceed as you wish.

### INTRODUCTION OF ASSOCIATES

General WILLIAMS. Thank you, Mr. Chairman.

I am pleased to appear before the committee and present the fiscal year 1988 budget request for the North Atlantic Division. I have with me today Mr. Edward Naughton, sitting to my right, who is the Chief of our Program Development Office; Mr. Neil Stuart, to my immediate left, who is the Deputy Chief of our Planning Division; and Mr. Eugene Brickman, to his left, of our Engineering Division.

I have a very brief opening statement, and, with your permission, I would like to submit a longer version for the record, Mr. Chairman.

Senator JOHNSTON. Without objection, we will put into the record your statement, and you may proceed as you wish.

### AREA OF RESPONSIBILITY

General WILLIAMS. The Division's civil work boundaries cover most of the heavily populated Northeast quadrant of our nation. Included are the seven major water drainage basins listed on this slide. Our responsibilities also include the Atlantic coast from Long Island, N.Y., to the Virginia-North Carolina border.

Our large population base requires us to work with thousands of local officials and numerous elected state and federal officials as shown on this slide.

You can tell from this slide that our area is a heavily populated region with a great deal of economic activity. Our four District offices are located in the major port cities you see on the map to the left. Naturally, navigation is one of our most important priorities. Our navigation improvements in this request would reduce transportation costs in these harbors.

### BUDGET SUMMARY

Our fiscal year 1988 budget request is $312.9 million, separated in these major categories: Construction general is the largest category at $156.3 million. I should also point out, Mr. Chairman, that this is the first time, underline, the first time that our construction general budget request has been greater than the O&M request since 1979. I think that this sends the right signals to our sponsors.

Since navigation is such an important priority in our region, I will highlight this activity first. As you can see, we have a heavy navigation workload.

### KILL VAN KULL AND NEWARK BAY, N.Y. AND N.J.

In New York Harbor, we have a number of navigation activities. This view shows Port Elizabeth on Newark Bay. This port will be one of the beneficiaries of our Kill Van Kull and Newark Bay Channels construction project.

Over 160 million tons of cargo moves through New York Harbor each year, and about 13 million tons are handled by the Port of Newark/Port Elizabeth complex.

The yellow area on this map shows the project. We will deepen the channel from 35 feet to 40 feet in the first phase of construction. The Port Authority of New York and New Jersey is the local sponsor.

### ARTHUR KILL-HOWLAND HOOK MARINE TERMINAL, N.Y. AND N.J.

Just west of the Kill Van Kull, our study will focus on the Arthur Kill Channel that serves the Howland Hook Marine Terminal. This is a 200-acre modern container port that handles about 1½ million tons of cargo annually.

The red area shows the project. We are investigating deepening the project initially from 35 to 40 feet, and the Port Authority of New York and New Jersey again is the sponsor.

### ARTHUR KILL, HOWLAND HOOK TO CARTERET, N.J.

Moving south on that waterway, we will continue to study the Arthur Kill to Carteret, N.J. reach. This study area is shown in light green on the map. This reach handles cargo in excess of 10 million tons annually. Full loading of vessels in this highly industrialized area is currently restricted by the existing depth. The state of New Jersey is the sponsor.

### MORICHES INLET, N.Y.

About 75 miles east of New York Harbor is Moriches Inlet on Long Island, N.Y. The bay and surrounding ocean area comprise an important marine fishery. However, shoaling in the inlet has made navigation hazardous. Our project includes work on the jetties and dredging a channel to 10 feet. New York State is the local sponsor.

### BARNEGAT INLET

Moving down the coast to Barnegat Inlet in New Jersey, we seek funds to continue this project modification; namely, construction of a new south jetty and to dredge a 10-foot-deep realigned channel to improve navigation.

Mr. Chairman, this is a very dangerous inlet. The Coast Guard has called it the most hazardous inlet on the east coast. Eleven lives have been lost since 1979. New Jersey is very enthusiastic about sponsoring this project.

Senator JOHNSTON. How far is Barnegat Inlet?

General WILLIAMS. Barnegat Inlet is about 35 miles northeast of Atlantic City.

Senator JOHNSTON. It would be basically to serve Atlantic City?

General WILLIAMS. No, sir; Barnegat Inlet does not directly serve Atlantic City.

Senator JOHNSTON. I understand that it would support commercial fishing and recreation boating, that sort of activity.

General WILLIAMS. That is correct, sir. The benefits are about four-fifths recreation boating and one-fifth commercial fishing. There is no major harbor served by the project.

Senator JOHNSTON. Thank you.

### DELAWARE RIVER COMPREHENSIVE NAVIGATION STUDY

General WILLIAMS. Moving inland to the Delaware River, we are continuing our comprehensive navigation study. The study includes investigation of improvements to channels serving the Ports of Trenton and Camden, N.J.; Philadelphia, Pa.; Wilmington, Del.; and others along the Delaware River and Bay.

This portion of the Delaware River averages about 114 million tons of cargo annually. This study has multiple sponsors: The Delaware River Port Authority, the Delaware River and Bay Authority, the city of Salem and Cumberland County.

### DELAWARE RIVER IN THE VICINITY OF CAMDEN, N.J.

At Camden, N.J., near the Beckett Street Terminal, we are requesting funds to initiate preconstruction engineering and design to deepen the channel from 37 to 40 feet to permit efficient transit of deep-draft vessels. This terminal moves about 1.1 million tons of cargo annually. The sponsor is the South Jersey Port Corporation.

### SCHUYLKILL RIVER, MOUTH TO PENROSE AVE., PA.

Nearby, we are studying the lower portion of the Schuylkill River from Penrose Avenue in Philadelphia to the point where it meets the Delaware River. Annual cargo on this waterway is about 6 million tons. Our recommended plan would deepen the channel from 33 feet to 40 feet. The city of Philadelphia is the sponsor of this project.

### BALTIMORE HARBOR AND CHANNELS, MARYLAND

Moving down to Baltimore Harbor, we find that an average of about 46 million tons of cargo is moved each year through that harbor. Our project will deepen the main shipping channels from 42 to 50 feet to allow more efficient use of large bulk carriers.

Mr. Chairman, I am happy to report that we have just awarded, about 2 weeks ago, the first construction contract for this project.

Shown in yellow on this slide, we see that roughly 57 of the 172 miles from the mouth of Chesapeake Bay to Baltimore will be dredged. Our request for fiscal year 1988 will continue the work that will be started this year. The state of Maryland is the sponsor.

### NORFOLK HARBOR AND CHANNELS, VIRGINIA

Moving farther south to Virginia, Norfolk Harbor moves about 60 million tons of cargo annually. As you know, Mr. Chairman, this is the nation's leading coal port. This project is located in the 25-square-mile harbor that serves the Ports of Norfolk, Chesapeake, Portsmouth, Newport News, and Hampton. With the requested funds, we will complete the first project phase that will provide a 50-foot-deep outbound channel. The Virginia Port Authority is the sponsor. I am also pleased to report that we have awarded the first construction contract for this project as well.

Moving now to another major priority in our area, which is flood damage prevention.

### SAW MILL RIVER AT ELMSFORD AND GREENBURGH, N.Y.

In New York State, flooding by the Saw Mill River in the Elmsford area has been frequent. Preconstruction engineering and design for the reformulated plan will be completed with the budgeted funds. The state of New York is the local sponsor.

### PASSAIC RIVER BASIN, NEW JERSEY

The Passaic River basin in New Jersey and New York has been labeled as having the worst flood problems in our region, probably on the east coast. If the 1903 flood of record occurred there today, it would cause well over $1.7 billion in damages. Our budget request contains funds to complete the phase I study for the Passaic River basin.

Also in the Passaic basin, I am testifying on three preconstruction engineering and design efforts at the locations shown on this map. I will report on the two new starts in our program. Both of the flooding scenes that I will show took place in April 1984.

### LOWER SADDLE RIVER, BERGEN COUNTY, N.J.

This first scene shows a view of the lower Saddle River in Lodi, N.J. Our plan would provide protection from a 150-year flood.

### RAMAPO RIVER AT OAKLAND, N.J.

This next scene is at the Ramapo River at Oakland, N.J. Our project here would provide protection from a 40-year flood. New Jersey and New York will sponsor Passaic River projects in their respective states.

### RARITAN RIVER BASIN, GREEN BROOK SUBBASIN, NEW JERSEY

Further south in New Jersey, we are studying the Green Brook subbasin that drains about 65 square miles of urban and industrialized area. We are requesting $1.4 million to continue preconstruction engineering and design on the project that you see here. The sponsor is the state of New Jersey.

### TAMAQUA, PA.

In Pennsylvania, Tamaqua is one of the main retail centers in Schuylkill County. It is located about 60 miles northwest of Philadelphia. The funds requested will be used to protect the town from flooding by the Wabash Creek. We have outlined the flood prone area on this slide. The borough of Tamaqua is the local sponsor, and the project has state support.

### WYOMING VALLEY, PA., LOCAL PROTECTION PROJECT

Farther west in Pennsylvania, we have a number of flood control projects as shown on this map. At Wyoming Valley, the four existing federal local protection projects, shown in white, function together as a system. Our plan of improvement in Wyoming Valley would include raising existing levees and floodwalls by 5 to 7 feet. That is the type of work you see on this slide. The fiscal year 1988 request will allow us to continue to refine our plan. Pennsylvania and Luzerne County are the local sponsors.

### LOCK HAVEN, PA.

Lock Haven, Pa., located on the west branch of the Susquehanna River, has been flooded numerous times. Our request for fiscal year 1988 would allow us to complete preconstruction engineering and design work on this project. The city of Lock Haven and Clinton County and the Commonwealth of Pennsylvania are the sponsors.

### SUSQUEHANNA RIVER BASIN AT HARRISBURG, PA.

Moving now to Harrisburg, Pa., this area has been flooded over 40 times since the 1700's. This view shows the Harrisburg Community College after the 1975 flooding. Our recommended plan calls for a floodwall, drainage facilities, and channel improvement. The city of Harrisburg is the local sponsor.

### RICHMOND, VA., LOCAL PROTECTION PROJECT

Moving further south to Virginia, shown here is downtown Richmond following Tropical Storm Juan in November 1985. Our plan of improvement includes floodwalls and levees on both sides of the James River in the downtown area. Funds requested for fiscal year 1988 will allow us to continue construction. The city of Richmond is the local sponsor.

Mr. Chairman, I met with the Governor on this project on Monday, and Governor Baliles is aware of the cost-sharing arrangement and the state is supportive.

### VIRGINIA BEACH STREAMS, CANAL NO. 2, VIRGINIA

This view shows the southernmost portion of the Virginia Beach Canal No. 2 project. The project involves the construction of a new canal and improvement of an existing canal in a crowded residential area. The city of Virginia Beach is the local sponsor and is in the process of acquiring the necessary real estate and easement to accommodate our plan.

### TROPICAL STORM JUAN

As a result of the November 1985 storm, parts of Virginia and West Virginia suffered major flooding damage. I am reporting for the first time on 5 areas on the upper James River and the South Branch of the Potomac River, for which studies were initiated as a result of that storm.

Starting first with Buena Vista, Va., the ruined goods you see at the rail sidings shown here mark the height of the flood water, which is about 7.5 feet. Two lives were lost and $45 million of damages were reported. At Covington, the water moved through at high velocity causing the damage of the kind you see here, $17 million in damages were reported.

Over in West Virginia, the South Branch of the Potomac River overran its banks in a number of places, one of which is shown on this slide. The town of Moorefield was hit hard. This is what a trailer park looked like after that storm. Three lives and $24 million damages were reported. Again in West Virginia, Petersburg also had its share of trouble, as you can see from this slide. West Virginia and the local communities in Virginia will sponsor their respective projects.

Our other activities include beach erosion control and hurricane protection.

### EAST ROCKAWAY INLET AND JAMAICA BAY, N.Y.

On the left side of this slide is how East Rockaway Beach, N.Y, looked when we started our project some 10 years ago, and the right side shows what the project looks like now. We expect to complete this project with the funds requested in fiscal year 1988.

Senator JOHNSTON. How did you do that, with groins that changed the flow and the deposits of sand?

General WILLIAMS. Sir, we dredged the material and then used it to nourish the beach by use of pipelines. The material was actually dredged from offshore and placed on the beach.

Senator JOHNSTON. But you didn't have to put groins out there?

General WILLIAMS. Groins were there already so we didn't have to do any groin work, other than one at the western end. We just had to deposit the sand on the beach.

### ATLANTIC COAST OF MARYLAND AND ASSATEAGUE ISLAND

Other activities include the autumn storms of 1985 which accelerated shoreline erosion all along the Atlantic coast. At Ocean City, Md., Hurricane Gloria caused about $10.5 million in damages. We are requesting funds for a hurricane protection plan that includes 6 miles of dunes and 1.8 miles of bulkhead. The state of Maryland is the local sponsor for this project.

### VIRGINIA BEACH, VA.

At Virginia Beach, the major problem is vulnerability to direct wave attacks during hurricanes and major storms. Our plan would improve the existing project and provide hurricane damage protection along an additional stretch of the beach. It has local support.

### WATER SUPPLY STORAGE

We have requested funds in our budget to modify three flood control projects in Pennsylvania to provide water supply. The Delaware River Basin Commission sponsors the first two and the Susequehanna River Basin Commission the third.

## OPERATIONS AND MAINTENANCE

Mr. Chairman, now that I have given you an overview of our construction and our general investigations programs, I would like to report on the second largest category of our budget. Our O&M request is for $142.7 million, and here again the greatest amount is allocated to navigation. The funds requested will provide for maintenance work on 37 channel and harbor projects and 9 protection of navigation projects. The request will also provide for operational requirements on 22 flood control projects, and naturally will fund our highly sensitive regulatory program.

## CONCLUSION

Mr. Chairman, this region is very important to our nation. I am happy to report that we have solid regional support. We have well developed plans and projects to support every dollar in this request. We have coordinated our activities with all other interested government agencies in our region.

Sir, that concludes my overview of the North Atlantic Division's fiscal year 1988 budget request of $312.9 million. I would be pleased to answer your questions at this time.

[The statement follows:]

# STATEMENT OF BRIG. GEN. CHARLES E. WILLIAMS

## INTRODUCTION

Mr. Chairman and Members of the Committee. I am Brigadier General Charles E. Williams, Commander of the North Atlantic Division. I am pleased to appear before the Committee to present our Fiscal Year 1988 Civil Works Budget Request. I have with me today Mr. Edward Naughton, Chief of our Program Development Office, Mr. Neil Stuart, Deputy Chief of Planning, and Mr. Eugene Brickman of our Engineering Division.

## AREA OF RESPONSIBILITY

The Division's civil works boundaries cover most of the heavily populated northeast quadrant of our nation. Included are the seven major water drainage basins: Lake Champlain, Hudson, Delaware, Susquehanna, Potomac, James River Basins, and part of the Chowan River Basin that extends into North Carolina. Our responsibilities also include the Atlantic coast from Long Island, N.Y., to the Virginia-North Carolina border.

## WORK WITH ELECTED OFFICIALS

Our large population base requires us to work with thousands of local officials, 88 Members of Congress, 22 Senators, and 11 state governors.

## REGIONAL CHARACTERISTICS

This is a heavily populated region with a great deal of economic activity. Our four District offices are located in the major port cities of New York, Philadelphia, Baltimore, and Norfolk. Thus, navigation is one of our most important priorities. Our navigation improvements in this request would reduce transportation costs in these harbors.

## BUDGET SUMMARY

Our fiscal year 1988 budget request is $312.9 million dollars, separated into three major categories. Construction General is the largest category at $156.3 million dollars, with Operations & Maintenance activities a close second at $142.7 million dollars, followed by General Investigations at $13.9 million dollars.

## NAVIGATION BUDGET REQUEST

Since navigation is such an important priority in our region, I will highlight this activity first. We have a heavy navigation workload and are requesting $125.6 million dollars for Construction General, $123 million dollars for Operations and Maintenance, and $2.1 million dollars for General Investigations.

## KILL VAN KULL & NEWARK BAY, NY & NJ

In New York Harbor, we have a number of navigation activities. The Port Newark and Port Elizabeth complex on Newark Bay will be one of the beneficiaries of our Kill Van Kull and Newark Bay Channels construction project.

Over 160 million tons of cargo moves through New York Harbor each year and about 13 million tons are handled by the Port Newark/Port Elizabeth complex.

We will deepen the channel from 35 to 40 feet in the first phase of construction. The Port Authority of New York/New Jersey is the local sponsor.

## ARTHUR KILL-HOWLAND HOOK MARINE TERMINAL, NY & NJ

Just west of Kill Van Kull, our study will focus on the Arthur Kill Channel that serves the Howland Hook Marine Terminal. This is a 200-acre modern containerport that handles about one and a half million tons of cargo annually. We will be investigating this reach to deepen initially from 35 To 40 feet. The Port Authority of New York/New Jersey is the local sponsor.

## ARTHUR KILL, HOWLAND HOOK TO CARTERET, NJ

Moving south on that waterway, we will continue to study the Howland Hook to Carteret NJ reach. This reach handles cargo in excess of 10 million tons annually. Full loading of vessels in this highly industrialized area is restricted by existing depths. The State of New Jersey is the sponsor.

## MORICHES INLET, NY

About 75 miles east of N.Y. Harbor is Moriches Inlet on Long Island. The bay and the surrounding ocean area comprise an important marine fishery. However, shoaling in the inlet has made navigation hazardous. Our project includes work on the jetties and dredging a channel to 10 feet. New York State is the local sponsor.

## BARNEGAT INLET, NJ

Moving down the coast to Barnegat Inlet in New Jersey, we seek funds to continue construction of a new south jetty and to dredge a 10-foot-deep realigned channel to improve navigation. New Jersey is the local sponsor.

## DELAWARE RIVER COMPREHENSIVE NAVIGATION SURVEY, PA, NJ & DE

Moving inland to the Delaware River, we are continuing our comprehensive navigation study. The study includes investigation of improvements to channels serving the Ports of Trenton and Camden, NJ, Philadelphia, PA, Wilmington, DEL, and others along Delaware Bay. This portion of the Delaware River averages about 114 million tons of cargo annually. The sponsors are the Delaware River Port Authority, the Delaware River and Bay Authority, the City of Salem and Cumberland County.

## DELAWARE RIVER IN THE VICINITY OF CAMDEN, NJ

At Camden, NJ, near the Beckett Street Terminal, we are requesting funds to initiate P E & D to deepen the channel from 37 to 40 feet to permit efficient transit of deep-draft vessels. This terminal moves about 1.1 million tons of cargo annually. The sponsor is the South Jersey Port Corporation.

## SCHUYLKILL RIVER, MOUTH TO PENROSE AVE, PA

Nearby, we are studying the lower portion of the Schuylkill River from Penrose Avenue in Philadelphia to the point where it meets the Delaware River. Annual cargo on this waterway is about 6 million tons. Our recommended plan would deepen the channel from 33 feet to 40 feet. The City of Philadelphia is the sponsor.

## BALTIMORE HARBOR & CHANNELS, MD & VA (50')

Moving down to Baltimore Harbor, we find that an average of about 46 million tons of cargo is moved each year. Our project will deepen the main shipping channels from 42 To 50 feet to allow more efficient use of large bulk carriers. Roughly 57 of the 172 miles from the mouth of Chesapeake Bay to Baltimore will be dredged. Our request for FY 88 will continue work that will be started this year. The State c Maryland is the sponsor.

## NORFOLK HARBOR & CHANNELS, VA

Looking farther south to Virginia, Norfolk Harbor moves about 60 million tons of cargo annually, and as you know, this is the nation's leading coal port. The project is located in the 25-square-mile harbor that serves the Ports of Norfolk, Chesapeake, Portsmouth, Newport News and Hampton. With the requested funds, we will complete the first project phase that will provide a 50-foot deep outbound channel. The Virginia Port Authority is the sponsor.

## FLOOD PROTECTION

Another of our major priorities is flood damage prevention.

### SAW MILL RIVER AT ELMSFORD AND GREENBURGH, NY

In New York State, flooding by the Saw Mill River in the Elmsford area has been frequent. Preconstruction engineering and design for the reformulated plan will be completed with the budgeted funds. The State of New York is the local sponsor.

### PASSAIC RIVER BASIN

The Passaic River Basin in New Jersey and New York has the worst flood control problem on the East Coast. If the 1903 flood of record occurred here today, it would cause well over $1.7 billion dollars in damages. Our budget request contains funds to complete the Phase I study for the Passaic River Basin. In the Passaic Basin, I am testifying on two preconstruction engineering and design efforts that are new starts in our program.

### LOWER SADDLE RIVER, BERGEN COUNTY, NJ

On the Lower Saddle River in NJ, our plan would provide protection from a 150-year flood.

### RAMAPO RIVER AT OAKLAND, NJ

On the Ramapo River at Oakland, NJ, our plan would provide protection from a 40-year flood.

New Jersey and New York will sponsor Passaic River Basin projects in their respective states.

### RARITAN RIVER BASIN, GREEN BROOK SUB-BASIN

Farther south in New Jersey, we are studying the Green Brook sub-basin that drains about 65 square miles of urban and industrialized area. We are requesting $1.4 million to continue preconstruction engineering and design. The sponsor is the State of New Jersey.

### TAMAQUA, PA

In Pennsylvania, Tamaqua is one of the main retail centers of Schuylkill County, about 60 miles northwest of Philadelphia. The funds requested will be used to protect the town from flooding by the Wabash Creek. The Borough of Tamaqua is the local sponsor, with state support.

### WYOMING VALLEY, PA (LEVEE RAISING)

Farther west in Pennsylvania, we have a number of flood control efforts. At Wyoming Valley, the four existing federal local protection projects at Kingston, Swoyersville, Plymouth, and Wilkes-Barre function together as a system. Our plan of improvement would include raising existing levees and floodwalls by five to seven feet. The FY 88 request will allow us to continue to refine our plan. The Commonwealth of Pennsylvania and Luzerne County are the sponsors.

### LOCK HAVEN

Lock Haven, PA, located on the west branch of the Susquehanna River, has been flooded numerous times. Our request for FY 88 would allow us to complete preconstruction engineering and design work on this project. The City of Lock Haven, Clinton County and the Commonwealtn of Pennsylvania are the sponsors.

### SUSQUEHANNA BASIN AT HARRISBURG, PA

Moving to Harrisburg, this area has been flooded over 40 times since the late 1700'S. Our recommended plan calls for a flood wall, drainage facilities and channel improvements. The City of Harrisburg is the sponsor.

### RICHMOND, VA (LOCAL PROTECTION)

Moving farther south to Virginia, downtown Richmond was inundated as a result of Tropical Storm Juan in November 1985. Our plan of improvement includes floodwalls and levees on both sides of the James River in the downtown area. Funds requested for FY 88 will allow us to continue construction. The City of Richmond is the local sponsor.

### VIRGINIA BEACH STREAMS, CANAL #2, VA

Our project at the Virginia Beach Streams, involves the construction of a new canal and improvement of an existing canal in a crowded residential area. The City of Virginia Beach is the local sponsor and is in the process of acquiring real estate needed for the recommended plan.

### TROPICAL STORM JUAN

As a result of that November 1985 storm, parts of Virginia and West Virginia suffered major flooding and damage. I am reporting to you for the first time on five areas on the upper James River and the south branch of the Potomac River, for which studies were initiated as a result of that storm. In Virginia, the areas are Buena Vista and Covington. In West Virginia, we will study the South Branch of the Potomac River, Moorefield, and Petersburg. West Virginia and local communities in Virginia will cooperate in sponsorship.

### BEACH EROSION CONTROL--HURRICANE PROTECTION

Other activities include beach erosion control and hurricane protection.

### EAST ROCKAWAY INLET TO ROCKAWAY INLET AND JAMAICA BAY, NY (PART I)

We expect to complete this project with the funds requested for FY 88.

### ATLANTIC COAST OF MARYLAND AND ASSATEAGUE ISLAND, VA

The autumn storms of 1985 accelerated shoreline erosion all along the Atlantic coast. At Ocean City, MD, Hurricane Gloria caused about $10.5 million dollars in damages. We are requesting funds for a hurricane protection plan that includes six miles of dunes and 1.8 miles of bulkhead. The State of Maryland is the sponsor.

### VIRGINIA BEACH, VA

At Virginia Beach, the major problem is vulnerability to direct wave attacks during major storms and hurricanes. Our plan would improve the existing project and provide hurricane damage protection along an additional stretch of the beach. It has local support.

## WATER SUPPLY STORAGE

We have requested funds in our budget to modify three flood control projects in Pennsylvania to provide water supply storage. They are the F.E. Walter Dam and Prompton Lake, which the Delaware River Basin Commission sponsors, and Cowanesque Lake, which the Susquehanna River Basin Commission sponsors.

## FRANCIS E. WALTER DAM, PA (MODIFICATION)

We are requesting $3.9 million to continue construction on the water supply modification to the F. E. Walter Dam. The project will raise this dam by 30 feet and add 23 billion gallons of water supply storage. New York, Philadelphia, Trenton, Bethlehem, Easton and more than 100 other communities in the Delaware River Basin will benefit from the added water supply.

## PROMPTON LAKE, PA (MODIFICATION)

Prompton Dam on the Lackawaxen River, near Honesdale, PA, controls the runoff from a 60-square mile drainage area, but it does not provide any water supply storage. Our plan would provide 9.1 billion gallons of water supply storage without reducing authorized flood protection.

## COWANESQUE LAKE, PA (MODIFICATION)

In central Pennsylvania, just below the New York State line, is where the Cowanesque Lake flood control project is located. The project will be modified to provide 8.3 billion gallons of water supply storage. Our $138,000 request for FY 88 completes federal funding.

## OPERATIONS AND MAINTENANCE

The second largest category in our budget is Operations and Maintenance. Our request is for $142.7 million dollars, and here again, the greatest amount is allocated to navigation. The funds requested will provide for maintenance work on 37 channel and harbor projects and nine protection of navigation projects. The request will also provide for operational requirements on 22 flood control projects and funds for our regulatory activities.

## REGULATORY PROGRAM

The workload in our regulatory program is growing. There continues to be pressure from developers for permits for work in sensitive areas. To meet these growing demands, our request for $7 million dollars is an eight per cent increase over FY 87. This modest increase will allow us to continue our work in this highly sensitive program.

## CONCLUSION

Mr. Chairman, that concludes my overview of the North Atlantic Division's Fiscal Year 1988 Budget Request of $312.9 million dollars. This region is very important to our nation and I am happy to report that we have solid regional support, and well-developed plans and projects to support this request. I would be pleased to answer any questions you may have.

Thank you.

## INCREASED CIVIL WORK PROGRAM

Senator JOHNSTON. Thank you very much, General Williams for an excellent presentation.

I notice that you have an $80 million increase in your budget. Does that present any problems as far as your capability to perform that big an increase in 1 year?

General WILLIAMS. Mr. Chairman, it does not. The reason I can speak so positively about this is because we have excellent local cooperation arrangements in place for all of our projects. We are also executing our fiscal year 1987 program on schedule.

As I mentioned, we have already awarded a large share of the work that we planned to do in fiscal year 1987. The first two contracts for the Baltimore Harbor dredging job, a very large one, have been awarded. The first contract for the Norfolk Harbor dredging job, another big one, has already been awarded. Liberty State Park has been awarded. We have Barnegat Inlet that you asked about earlier scheduled for award this month; the Moriches Inlet is scheduled for award, and so on. We see nothing that would prevent us from executing as per our plan. The significant funding increase presents no problem to this division for execution.

Senator JOHNSTON. No manpower problems?

General WILLIAMS. No, sir.

Senator JOHNSTON. How do you see the budget request changing over the next 5 years?

General WILLIAMS. Over the next 5 years (fiscal years 1988–92) we expect our overall budget request to remain fairly stable. Although we will have construction projects such as Baltimore Harbor and Kill Van Kull completed in fiscal year 1989, there will be a number of preconstruction engineering and design projects that will become available for initiation of construction in fiscal year 1989 and fiscal year 1990. The O&M portion of the budget should experience an increase as a result of the maintenance requirements for the completed harbor projects.

## FORT DRUM ARMY POST, N.Y.

Senator JOHNSTON. I notice that you are responsible for the new Army Post at Fort Drum. What impact will that undertaking have on your civil works responsibilities?

General WILLIAMS. Sir, it will not have an impact on the execution of our civil works program because, as you know, we manage those two programs separately. The Fort Drum project, obviously, is a large and visible project on the military side, and we are managing it from military assets.

Senator JOHNSTON. What are your peak years of activity in there?

General WILLIAMS. Sir, it will be starting later this year, and peak actually in fiscal year 1988. We will be letting the followon contract for most of the structures that will be above the ground, hopefully, in April, and then we will peak out in 1988.

Senator JOHNSTON. What is the total cost at Fort Drum?

General WILLIAMS. The total cost for all of the construction will be in excess of $1 billion.

Senator JOHNSTON. Thank you very much, General.

### ADDITIONAL PREPARED QUESTIONS SUBMITTED FOR THE RECORD

I have some additional questions prepared by the staff and Senator Specter has submitted some questions as well. Senator Specter will submit his questions in writing, and Senator Byrd also has some questions in writing as well.

Thank you very much, General Williams.

[NOTE: The following questions were not asked, but were placed in the hearing record for response by the Corps.]

## QUESTIONS SUBMITTED BY SENATOR JOHNSTON

### BALTIMORE HARBOR AND CHANNELS, MARYLAND AND VIRGINIA

Senator JOHNSTON. Has the Corps awarded the first dredging contract? If so, how did the contract price compare to the government estimate?

General WILLIAMS. The first dredging contract, which covers work in the Maryland channels, was awarded on 20 February 1987. The contract price was $53,889,000 compared with the government estimate of $46,683,000. The second dredging contract, which covers work in the Rappahannock Shoal Channel, was awarded on 3 March 1987. The contract price was $4,964,000 compared with the government estimate of $10,077,000.

Senator JOHNSTON. Congress appropriated $54 million for this project for the current fiscal year -- the full amount requested by the Administration, yet the Corps plans to allocate only $36 million. Why have you not been able to use the full amount appropriated?

General WILLIAMS. We will not be able to use the full amount appropriated because of delays stemming from the enactment of the 1986 Water Resources Development Act in November 1986 in lieu of May 1986 as anticipated last year.
In addition because of the recent good bid experience, we expect that the $36 million Corps allocation will be adequate for optimal progress on the project.

Senator JOHNSTON. Tell the committee about the Corps' work and progress on the Baltimore Harbor and Channels deepening.

General WILLIAMS. Work on both the Maryland and Virginia channels is expected to begin in March 1987. Maryland channel work involves deepening the Craighill Angle and Upper Range, Curtis Bay and the Fort McHenry channel to 50 feet, deepening the Northwest Branch East Channel to 49 feet, and deepening the Northwest Branch West channel to 40 feet. The contract for this work was awarded on 20 February 1987. Virginia channel work includes deepening the Rappahannock Shoal and York Spit Channels to 50 feet. The contract for the Rappahannock Shoal Channel was awarded on 3 March 1987 and award of the York Spit Channel is expected by the end of March 1987.

### NEW YORK HARBOR COLLECTION AND REMOVAL OF DRIFT

Senator JOHNSTON. Was any provision made in PL 99-662 to raise the cost ceiling on the New York Harbor Collection and Removal of Drift project?

General WILLIAMS. No, sir. The Water Resources Development Act of 1986 (PL 99-662) did not contain any provision for raising the Federal cost ceiling.

Senator JOHNSTON. When did the Corps and public first know that there would be a cost ceiling problem?

General WILLIAMS. The present appropriation ceiling for this project was established by the Water Resources Development Act of 1976. We have known for the past several years that the fiscal limitation would be reached before the project was completed. Within the last year it became apparent that the ceiling would be reached after FY 1988.

Senator JOHNSTON. How much non-Federal funds have been spent on the project?

General WILLIAMS. As of 30 September 1986, non-Federal interests had spent about $22 million, consisting of a cash contribution of $8.3 million and approximately $13.7 million in other costs.

Senator JOHNSTON. If the cost ceiling is raised, would the remaining elements be subjected to a new cost sharing agreement in accordance with PL 99-662? How would any new cost sharing agreement compare to the current level?

General WILLIAMS. If the cost ceiling is raised, the remaining elements would be cost shared at the current level since Public Law 99-662 did not address this type of project.

## ARDSLEY, N.Y.

Senator JOHNSTON. Explain why only $300,000 of the $2,000,000 appropriation for the Ardsley project in New York will be allocated in the current year.

General WILLIAMS. Initiation of construction has been delayed due to delays in acquiring the necessary real estate. We expect sufficient real estate to be acquired to make an initial contract award by September 1987.

## QUESTIONS SUBMITTED BY SENATOR SPECTER

### LACKAWANNA RIVER

General, I have personally visited the area and am abreast of the flood damage in northern Pennsylvania, particularly in Scranton. There is an urgent need to repair this damage and erect measures to combat the adverse effects of floods.

Question. In this light, what is the current status of Lackawanna River Basin project?

Answer. The study for the Lackawanna River Basin was initiated in late December 1986. The initial or reconnaissance phase is scheduled for completion in December 1987.

Question. With regard to the feasibility study, what projections do you have with regard to its completion?

Answer. The feasibility phase of the study is currently scheduled for completion in September 1990.

Question. How can the timetable for the feasibility study be shortened?

Answer. The reconnaissance report will develop data required to make better estimates of the cost and time required to do the feasibility study. My office will review the estimates to make sure the study is done as soon as feasible. I would like to note that the initial estimates were set with the objective of finishing the study as soon as possible, so I would expect little, if any, reduction in study time.

Question. Can Fiscal Year 1987 funds be reprogrammed in order to hasten this study?

Answer. No, sir. I have been provided sufficient funds to complete the reconnaissance report in the shortest time possible.

Question. Will you be able to visit the Scranton area with me?

Answer. Yes, sir. I would be delighted to visit the Scranton area with you and will contact your office to arrange such a visit.

Question. Would you explain why the Army Corps of Engineers has not included funding for the following projects in the Fiscal Year 1988 Budget Request?

Schuylkill River Basin, Pottstown, PA
Milton, PA
Curwensville Lake, PA (Waterline)

Answer. The Schuylkill River Basin, Pottstown and the Milton, Pennsylvania projects both have benefit-cost ratios below unity and do not meet the economic selection criteria for budgeted projects.

With respect to Curwensville Lake, Pennsylvania (Waterline) project, the local sponsor has not expressed any interest in the project.

## SUSQUEHANNA RIVER AT SUNBURY, PA (CLOSURE STRUCTURE)

Question. Will the Army Corps of Engineers fold the cost (estimated at $56,000) for this closure project into the Wyoming Valley project?

Answer. The cost is already included in our levee raising project. The Wyoming Valley project authorized by the 1986 Water Resources Development Act includes measures to mitigate induced flooding at Sunbury. These measures include raising of the existing levees at Sunbury which would require permanent closure of the structure at the abandoned Reading Railroad site. Should this feature of our levee raising plan be eliminated during our on-going Wyoming Valley Channel design memorandum effort, we would separately address the need for the permanent closure on its own merits.

Question. If the Army Corps of Engineers does decide to fold this project into the Wyoming Valley project, will the integrity of these funds be preserved?

Answer. No, sir. The funds would not be specifically identified in a future budget request. They would be included in a larger amount to fund work for the entire project.

## MARSH CREEK BRIDGE

Question. Was the damage to this bridge caused by the discharge of water from the Federally built Foster Joseph Sayers Dam?

Answer. Yes, sir. The bridge was damaged during the Tropical Storm Agnes in June 1972.

Question. Has the Army Corps of Engineers determined the owner of this bridge?

Answer. Liberty Township, PA owns Township Road 866 including the bridge across Marsh Creek and would be the potential non-Federal sponsor for the bridge repairs.

## LOW COST DEMONSTRATION PROJECTS ALONG THE CHESAPEAKE BAY SHORELINE

Question. Why hasn't the Army Corps of Engineers spent the appropriated funds for this project?

Answer. Funds in the amount of $300,000 were provided for demonstration projects in the Fiscal Year 1986 Appropriation Act. Funds were not allocated to this work in Fiscal Year 1986 as there was no authority to do this work.

## QUESTIONS SUBMITTED BY SENATOR BYRD

### UPPER POTOMAC RIVER BASIN

Question. In the wake of extremely severe flooding that occurred in West Virginia in November of 1985, the Corps of Engineers has initiated three reconnaissance studies in the Upper Potomac River Basin. What is the status of those studies?

Answer. All three studies are in the reconnaissance stage and scheduled for completion in October 1987.

Question. What have you learned to date in Petersburg, Moorefield, and the South Branch area in general?

Answer. For Petersburg and Moorefield we have identified projects that we believe will meet Corps criteria for a Federal project. For the South Branch, the reconnaissance report will determine if such a potential project exists in the South Branch Potomac River Basin.

Question. I understand that you have requested full funding for the fifty percent U.S. Government share of the feasibility studies that would follow the reconnaissance reports this fall, is that correct?

Answer. No, sir. We have only requested sufficient funds to meet our Fiscal Year 1988 requirements for these feasibility studies.

Question. How much is requested for the each feasibility study?

Answer. The reconnaissance reports will refine the feasibility costs. At present we estimate that the Federal share will be $277,000 for Petersburg, $230,000 for Moorefield and $440,000 for the South Branch Potomac River. Our Fiscal Year 1988 budget request includes $150,000 for Petersburg, $130,000 for Moorefield and $240,000 for the South Branch Potomac River.

Question. Are the local government required to match this funding for the feasibility studies?

Answer. Yes, sir. Local interests will have to match the Federal funds on a one to one basis.

Question. Also, I would like to ask you to coordinate carefully with the Interstate Commission on the Potomac River Basin to make certain that the efforts of both bodies are well-focused on the Upper Potomac River Basin.

Answer. Yes, sir. We wll be happy to do so.

## ABILITY TO PAY

Question. What is the status of the Army Corps of Engineers "Ability to Pay" regulations?

Answer. The Office of Chief of Engineers is currently reviewing and refining a proposed methodology for the regulations.

Question. What criteria are the Army Corps of Engineers presently considering as a measure of Ability to Pay?

Answer. The tentative thinking is that the focus will be on certain sponsors in low income states. This means that high per capita income communities and communities in a state with high per capita income would not quality. The Corps of Engineers believes that high income states should be asked to assist a particular community within that state when the community is unable to pay the normal cost share. The communities that the Corps of Engineers identifies under this procedure would become candidates for reductions in the level of cost sharing under the Ability to Pay provision. Even in these cases however, a healthy benefit cost ratio should imply that additional income will accrue to the beneficiaries; income that could be used to pay the normal non-Federal share of the costs. In order to relieve a project sponsor of normal cost sharing responsibilities, the Corps of Engineers would take a carefull look at the magnitude and the incidence of benefits produced by the project.

Question. When will a draft of the regulations be available for review?

Answer. The Office of the Chief of Engineers expects to have a draft of the regulations ready for public review in the next few months.

Question. When will the regulation be finalized?

Answer. Once the draft regulations are made available to the public, the Office of the Chief of Engineers wants to assure that sufficient time has been allowed for public comment. Accordingly, the final regulations will not be adopted until some time near the end of the calendar year.

## IN-KIND SERVICES

Question. I understand that up to one half of the local cost share can be provided in the form of in-kind services. What are some examples of these in-kind services?

Answer. In-kind services will vary based on the requirements of the study effort and the technical capability of the local sponsor. Some examples of in-kind services are as follows: topographic mapping; real estate requirements such as listing of structures on the flood plain and their current market values; social-economic data; conducting surveys of cultural and historic resources; and geotechnical data such as soil samples and rock borings and the location of potential borrow and disposal areas.

Question. Will you explore all the possibilies to ensure that West Virginia gets full credit for all of its in-kind work on these studies?

Answer. Yes, sir. We will explain all options available to the local interests.

## PACIFIC OCEAN DIVISION

### STATEMENT OF BRIG. GEN. ROBERT H. RYAN, DIVISION ENGINEER

ACCOMPANIED BY:
  KISUK CHEUNG, CHIEF, ENGINEERING DIVISION
  JOHN R. PELOWSKI, CHIEF, PLANNING BRANCH
  RUSSELL H. TAKARA, CHIEF, PROGRAM SECTION
  LORRAINE E. INOUYE, PROGRAM SECTION

Senator JOHNSTON. General Ryan, welcome to the committee. Please introduce your staff and then you can proceed when ready.

General RYAN. Thank you, Mr. Chairman.

Mr. Chairman, I am pleased to be here to report on the civil works program in the Pacific Ocean Division of the U.S. Army Corps of Engineers. With me are Mr. Kisuk Cheung, on my right, who is Chief of our Engineering Division; Mr. John Pelowski, on my left, who is Chief of our Planning Branch; and Mr. Russell Takara and Mrs. Lorraine Inouye, who are members of the Program Section.

Senator JOHNSTON. Are you kin to the Senator, Mrs. Inouye?

General RYAN. She says that she is not, Senator. We visited Senator Inouye yesterday, and he asked the same question. [Laughter.]

#### AREA OF RESPONSIBILITY

Mr. Chairman, the Pacific Ocean Division civil works area of responsibility includes the state of Hawaii, the territories of Guam and American Samoa, the Commonwealth of the Northern Marianas Islands, and the Trust Territory of the Pacific Islands. With the recent passage of the Compact of Free Association, the Federated States of Micronesia and the Republic of the Marshall Islands are now independent nations and no longer part of the trust territory. The Republic of Belau remains the only entity still within the trust territories. Our remaining civil works responsibilities in the Federated States of Micronesia and the Marshall Islands consist of continuing construction of the Nanpil River hydropower project in Pohnpei, and completion of minor planning studies initiated prior to passage of the Compact.

Senator JOHNSTON. How many megawatts is that Pohnpei project?

General RYAN. The Nanpil River hydropower project will provide generating capacity of 1,700 kilowatts.

Our area of responsibility stretches across a broad expanse of the Pacific Ocean, ranging from the high rises of Honolulu to lonely atolls in the Central Pacific. All of our customers have one thing in common, they all live on islands, and all share the same basic water resource needs; for navigation facilities, shore protection, flood control, and for safe and efficient supplies of water and power.

Senator JOHNSTON. That is the Pohnpei area, is it? [Referring to slide.]

General RYAN. That is on the island of Hawaii, sir.

In the Pacific Ocean Division, we work with our customers to meet these needs and to protect the unique island environments.

This morning, I will first highlight our fiscal year 1986 accomplishments, review our fiscal year 1987 activities, and then I will address our fiscal year 1988 budget request.

## FISCAL YEAR 1986 ACCOMPLISHMENTS

I am happy to report that the local cooperation agreement for the Kahoma Stream flood control project on the island of Maui was jointly signed in May, and the construction contract was awarded in September, as scheduled. Because of the favorable bidding climate, the total project cost is expected to be $17.2 million, or $6.9 million less than reported last year. This includes a reduction of $6 million in federal cost.

The project to repair the Nawiliwili Harbor breakwater on the island of Kauai was awarded, as scheduled, in May. Groundbreaking ceremonies were held in August with Congressman Akaka in attendance. Completion of the breakwater repair is scheduled for August 1987 at a cost of $3.7 million.

Construction of the Nanpil River hydropower project in Pohnpei has continued. At this time the project is 50-percent complete and we expect to have the plant in operation in December of this year. The training of local technicians and the operation and maintenance of this plant will be provided for 1 year under a Corps of Engineers contract.

Because of continuing erosion of the airstrip at Ofu, American Samoa, a contract for construction of a shoreline protection project was awarded in August under the continuing authorities program. The small boat harbor project at Agat, Guam, was advertised for construction in September and awarded in October. The planned construction award for navigation improvements at Laupahoehoe on the island of Hawaii is planned for fiscal year 1987.

The Commonwealth of the Northern Marianas Islands and the Corps of Engineers executed the study cost-sharing agreement in May for the feasibility investigation of commercial harbor improvements in Saipan to support current and projected waterborne commerce needs. This study will be completed in 1987. Reimbursable design for rehabilitation of an existing dock and for construction of a new dock at the Saipan Port was completed for the commonwealth government. Contract documents will be completed this fiscal year.

## FISCAL YEAR 1987 ACTIVITIES

Turning now to our fiscal year 1987 activities, we will proceed on a number of construction projects and survey studies and we will continue our operation and maintenance program.

Groundbreaking ceremonies for the Kahoma Stream flood control project were held with Mayor Hannibal Tavares on January 6, the same day the 100th Congress convened.

Construction plans and specifications for the Agana River flood control project in Guam, authorized by the 1986 Water Resources Development Act, are being completed. We expect to initiate construction this summer. The estimated project cost is $5.3 million. Construction will be completed in 1989.

Construction of the Kahawainui Stream flood control project on the island of Oahu is planned to be initiated in September under the continuing authorities program.

The erosion protection revetment project at the airstrip on the island of Ofu, American Samoa, mentioned earlier, was completed in October 1986. Repair of the breakwater at Nawiliwili Harbor on the island of Kauai will be completed this summer.

Our survey program for fiscal year 1987 consists of four studies. The Guam comprehensive study and Northern Marianas Islands comprehensive study will be completed. Review of the coasts of the Hawaiian Islands study will continue and the Keopu-Hienaloli Stream flood control study on the island of Hawaii will be initiated.

Under our operation and maintenance program, in addition to regulatory activities, project condition surveys will be completed at three harbors.

## FISCAL YEAR 1988 BUDGET REQUEST

The Pacific Ocean Division budget request for 1988 is $6,782,000.

The $889,000 included in the President's budget for general investigations is funding for five survey investigations.

## HILO BAY METROPOLITAN AREA

The $77,000 requested for the Hilo Bay Metropolitan Area study will be used to complete the interim study report for commercial craft and to complete the summary report for the comprehensive study.

## HARBORS AND RIVERS IN HAWAII

The requested $60,000 for harbors and rivers in Hawaii will be used to complete an interim report for light-draft navigation for the state of Hawaii. Major work in fiscal year 1988 will be to complete detailed studies for improvements to three harbors.

## KEOPU-HIENALOLI STREAM—HARBORS AND RIVERS IN HAWAII

The $102,000 requested for Keopu-Hienaloli Stream on the island of Hawaii will be used to initiate the feasibility phase of the study. This study was requested by the county of Hawaii to define flooding problems and to identify possible solutions to reduce flood damage in Kailua, Kona. The study is scheduled to be completed in fiscal year 1989.

### NORTHERN MARIANAS ISLAND HARBOR

The $350,000 requested for Saipan Harbor, Commonwealth of the Northern Marianas Islands, will be used to initiate preconstruction engineering and design for widening and deepening the entrance channel and the harbor basin.

### ALENAIO STREAM

The $300,000 requested for Alenaio Stream on the island of Hawaii will be used to initiate preconstruction engineering and design. This project was authorized for construction by the Water Resources Development Act of 1986. This flood control improvement will provide 100-year flood protection in the Hilo urban area.

Our construction budget request is $4.9 million for continuation of construction on the Agana River and the Kahoma Stream flood control project.

### AGANA RIVER

The $2.5 million contained in our budget request for the Agana River project will be utilized to continue construction of this urgently needed flood protection for the capital city of Guam, Agana.

Senator JOHNSTON. What is that project?

General RYAN. It is a flood control project, Mr. Chairman. The project will consist of 2,500 feet of levee and floodwall, and 1,700 feet of channel improvement and will prevent flood damage averaging approximately $700,000 annually. The project is scheduled to be completed in fiscal year 1989.

### KAHOMA STREAM

The requested $2.4 million will be used to continue construction of the Kahoma Stream flood control project to provide urban flood protection for the Lahaina community on the island of Maui. The project is scheduled to be completed in fiscal year 1989.

### OPERATION AND MAINTENANCE

Our budget request for operation and maintenance is $993,000 and includes $695,000 for general regulatory functions, $237,000 for project condition surveys, $11,000 for inspection of completed works, and $50,000 for operation of the regional visitor center.

### SUMMARY

In summary, our fiscal year 1988 budget request of $6,782,000 will provide for continuation of Corps of Engineers water resources planning, construction, and operation and maintenance of civil works projects in the Pacific basin.

Mr. Chairman, this completes my presentation. I will be pleased to answer any questions that you or other committee members may have.

## FUTURE ROLE OF THE CORPS OF ENGINEERS

Senator JOHNSTON. Thank you very much, General Ryan.

The civil works program for the Pacific Ocean Division continues the downward trend in fiscal year 1988. How do you assess the role of the Corps of Engineers in the Pacific Ocean region?

General RYAN. Mr. Chairman, it is true that the program in civil works is not large. However, it contributes significantly to the region in terms of appropriate and timely response to critical water resource needs, and it also provides significant benefits to the U.S. defense interests in the Pacific.

Senator JOHNSTON. What has been the level of military work over the past few years in your Division?

General RYAN. Mr. Chairman, over the last several years, our total military program has been approximately $1.1 billion annually, which includes about $600 million U.S. funded design and construction and approximately $500 million funded by the governments of Japan and the Republic of Korea in support of U.S. forces in these countries.

## ADDITIONAL PREPARED QUESTIONS FOR THE RECORD

Senator JOHNSTON. Thank you very much for your excellent presentation, General Ryan. We appreciate having you here.

I have some additional questions prepared by the committee staff which I make part of the record for your response.

Thank you.

[NOTE: The following questions were not asked, but were placed in the hearing record for response by the Corps.]

## QUESTIONS SUBMITTED BY SENATOR JOHNSTON

### OPERATION AND MAINTENANCE

Senator JOHNSTON. There is also a sizable reduction in the O&M requirements for 1988. What is the reason for that reduction?

General RYAN. Our fiscal year 1987 O&M program requirement of $3.7 million included $2.9 million for completion of repairs to the Nawiliwili Harbor breakwater on Kauai. Our fiscal year 1988 O&M budget request of $1.0 million is sufficient for our identified operation and maintenance requirements.

### SMALL PROJECTS PROGRAM

Senator JOHNSTON. What part does the Small Projects Program play in your Division? Provide for the record a table which shows the eligible projects, along with a brief description and funding capability.

General RYAN. Sir, as I mentioned earlier, the Small Projects Program plays a significant role in the Pacific Ocean Division's ability to respond in a timely manner to water resources needs. Under this program, 35 projects have been constructed and 17 additional projects are now in planning, design, or construction stages. I will submit for the record the information on eligible projects.
[The information follows]

## ELIGIBLE PROJECTS
## FY87-FY88

| DESCRIPTION | ANTICIPATED FUNDING | |
|---|---|---|
| | FY87 | FY88 |
| Section 107: | | |
| Agat SB Harbor, Guam | 1,196,000 | 410,000 |
| Kahului SB Harbor, Maui | 80,000 | 80,000 |
| Laupahoehoe Harbor, Hawaii | 1,012,000 | 1,000,000 |
| Merizo Harbor, Guam | 12,000 | 70,000 |
| Section 103: | | |
| Lepua Area, Am Samoa | 60,000 | 680,000 |
| Section 205: | | |
| Kahawainui Stream Hawaii | 310,000 | 1,400,000 |
| Garapan Area, CNMI | 200,000 | 670,000 |
| Lake Susupe, CNMI | 190,000 | 0 |
| Vaipito Stream, Am Samoa | 60,000 | 35,000 |
| Section 14: | | |
| Masefau, Am Samoa | 10,000 | 282,000 |
| Aunuu School, Am Samoa | 20,000 | 275,000 |
| Ofu School, Am Samoa | 20,000 | 225,000 |
| Beach Road, CNMI | 45,000 | 200,000 |

## NORTHERN MARIANAS ISLAND HARBOR

Senator JOHNSTON. What is the need for widening and deepening the entrance channel for the Northern Marianas Island Harbor?

General RYAN. The existing 300-foot wide Saipan Harbor entrance channel, with a controlling depth of minus 27 feet, severely restricts transocean vessels from safely entering and leaving the harbor. Many vessels with loaded drafts presently transit the harbor only at times of high tide and good sea conditions, in order to avoid the risk of damage or grounding. Furthermore, because of the existing channel dimensions, other cargo vessels bypass Saipan and consequently cargo must be transshipped from Guam. Entrance channel and harbor basin improvements will allow for safer and more efficient commercial navigation for Saipan.

Senator JOHNSTON. What is the estimated cost of the proposed modification? Is the current channel depth and width insufficient to handle existing traffic?

General RYAN. The preliminary cost estimate of the proposed harbor modification is $14 million. The existing channel depth and width is inadequate to efficiently handle current and future traffic.

Senator JOHNSTON. In your professional opinion, are the non-Federal interests capable of providing the required cost sharing on the project? What is the status of the local cost sharing agreement?

General RYAN. Yes, sir. The Government of the Northern Marianas has provided their 50 percent share of initial feasibility study work. The local cost sharing agreement for construction will be developed for discussion with the Government of the Northern Marianas later this year. I am confident that the project sponsor will be capable of providing the non-Federal share for construction and will execute the agreement at such time as the project is funded for construction.

## KAHOMA STREAM, MAUI, HAWAII

Senator JOHNSTON. Why is a reduced level of effort -- $5.8 million allocation for 1987 versus a budget request of only $2.4 million -- planned on the Kahoma Stream, Maui, Hawaii project?

General RYAN. Sir, as I mentioned earlier, the reduced level requirement for Federal funds in fiscal year 1988 results primarily from the very favorable construction bid received. In addition to our $2.4 million request, contractor earnings in fiscal year 1988 for non-Federally funded work are expected to be about $1.7 million.

## REMAINING ITEMS

## STATEMENT OF MAJ. GEN. HENRY J. HATCH, DIRECTOR OF CIVIL WORKS

**ACCOMPANIED BY:**
- **DON CLUFF, CHIEF, PROGRAMS DIVISION**
- **WILLIAM LOCKWOOD, ASSISTANT CHIEF, POLICY, REVIEW, AND INITIATIVES DIVISION**
- **CECIL GOAD, CHIEF, OPERATIONS AND READINESS DIVISION**
- **DAN MAULDIN, CHIEF, PLANNING DIVISION**
- **WILLIAM MURDEN, CHIEF, DREDGING DIVISION**
- **LLOYD DUSCHA, DEPUTY DIRECTOR, ENGINEERING AND CONSTRUCTION**
- **WILLIAM ROPER, ASSISTANT DIRECTOR, RESEARCH AND DEVELOPMENT**
- **RICHARD COLVER, DEPUTY DIRECTOR, INFORMATION MANAGEMENT**

### PREPARED STATEMENT

Senator JOHNSTON. General Hatch, welcome back. Please identify those with you and then proceed.

Your complete statement will be included in the record.

[The statement follows:]

# STATEMENT OF MAJ. GEN. HENRY J. HATCH

## INTRODUCTION

Mr. Chairman and members of the Subcommittee, I am honored to make this appearance before you as Director of Civil Works. With me today are: Mr. Don Cluff, Chief, Programs Division; Dr. Bory Steinberg, Chief, Policy, Review, and Initiatives Division; Mr. Cecil Goad, Chief, Operations and Readiness Division; Mr. Dan Mauldin, Chief, Planning Division; Dr. Ming Tseng from the Hydraulics and Hydrology Division; Mr. Bill Murden, Chief, Dredging Division; from my staff in the Civil Works Directorate and from other Directorates Mr. Lloyd Duscha, Deputy Director of Engineering and Construction; Dr. William Roper, Assistant Director of Research and Development (Civil Works); and Mr. Richard Colver, Deputy Director for Information Management.

I would like to note some highlights of the FY 1988 budget requests for Remaining Items, which include our nationwide programs and activities not covered in the presentations of the Division Commanders. These also include the General Expenses appropriation, which provides for executive direction and management of the Civil Works program through the Office of the Chief of Engineers and the Division Offices. I will touch on major items of plant and equipment proposed for procurement under the Revolving Fund, and also briefly discuss the Transfer Budget Request for FY 1987, which involves the transfer of Construction, General funds to the General Expenses appropriation. Following these, I will present a brief overview and representative sampling of some of our current R&D activities and recent accomplishments.

## REMAINING ITEMS OVERVIEW

The total for Remaining Items in the budget request is $327,883,000, of which $45,390,000 is for General Investigations, $99,978,000 for Construction, General, $29,315,000 for Operation and Maintenance, General, $26,000,000 for Flood Control and Coastal Emergencies, and $128,200,000 for General Expenses.

## ACTIVITIES UNDER THE GENERAL INVESTIGATIONS APPROPRIATION

### REVIEW FOR DEAUTHORIZATION

The Review for Deauthorization activity, is conducted under Sec. 12 of the Water Resources Development Act of 1974, and under Sec. 1001 of the Water Resources Development Act of 1986. Under Section 12 of the 1974 Act we have submitted 11 annual reports to Congress, and 485 projects have been deauthorized to date. Section 1001 of the Water Resources Development Act of 1986 directs the Secretary of the Army to transmit to Congress, by November 1987, a list of authorized unconstructed projects, or separable elements of projects, for which no funds have been obligated for construction during the 10 fiscal years preceding the transmittal of the list. Projects on the list will not be authorized unless obligations for construction are made for them prior to 31 December 1989. A similar list is to be submitted every two years after the initial list. Projects on these lists will no longer be authorized if funds have not been obligated for construction during the 30-month period following submittal of the list.

We have requested $500,000 for Fiscal Year 1988 to review the Corps backlog of authorized unconstructed projects. In Fiscal Year 1987 no funds have been allocated to this program. The deadline of 31 December 1989, established by the Water Resources Development Act of 1986 for deauthorization of all authorized projects which have received no construction obligations for the past 10 years, will require a review of the Corps backlog to determine which, if any, such projects merit funding prior to deauthorizations date.

## COOPERATION WITH OTHER FEDERAL AGENCIES, STATES, AND NON-FEDERAL INTERESTS

The budget request for Cooperation with Other Federal Agencies, States, and non-Federal Interests is $7,650,000, an increase of $850,000 from the FY 1987 allocation of $6,800,000. A major portion of this request is $3,400,000 for Planning Assistance to States, including all 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands. Under this program, we coordinate with and assist State planners to prepare comprehensive plans for conservation, development, and utilization of their water and related resources; help them become more active and effective working partners with the Federal Government in resolving water resources problems of mutual interest; and submit reports and recommendations to Congress on appropriate Federal partnership in execution of cooperative plans. In each of the past 4 years we have spent an average of 88% of the funds available to this program. Another major portion of the request is $3,650,000 for Special Investigations, including: review of applications referred to us by the Federal Energy Regulatory Commission for permits or licenses for non-Federal hydropower developments at, or affecting, Corps water resource projects; and review of reports and environmental impact statements of other agencies.

The amount requested is an increase of $850,000 primarily due to the high level of requests for information and analysis of high water levels of the Great Lakes. Record high lake levels in recent years have caused and are predicted to continue to cause serious problems of flooding, structural damage, and erosion at numerous locations throughout the Great Lakes. These funds will be used to respond to requests by both public and private parties for investigations of these problems and to provide technical assistance in the formulation of local solutions.

## COLLECTION AND STUDY OF BASIC DATA

The request for $15,240,000 for Collection and Study of Basic Data is an increase of $5,100,000 over the FY 1987 allocation. There are ten programs under this category, and I will discuss individually the three largest programs, namely, Flood Plain Management Services, Coastal Field Data Collection and International Waters Studies. A fourth activity, Inventory of 1986 and is being resumed in FY 1988. The other six programs, which total $2,240,000 and remain essentially level-funded, are: Stream Gaging ($535,000), for which we transfer funds to the U. S. Geological Survey; Precipitation Studies ($380,000), for which we transfer funds to the National Weather Service; Hydrologic Studies ($260,000); Scientific and Technical Information Centers ($130,000); Transportation Systems ($700,000); and Environmental Data Studies ($235,000).

Non-Federal Dams, was reauthorized by the Water Resources development Act of

Flood Plain Management Services. The largest portion of the Collection and Study of Basic Data request is $9,200,000 for the Flood Plain Management Services program, an increase of $2,900,000 over the FY 1987 allocation. This program provides the most important non-project service that the Corps makes to local populations and the general public. It is also one of our most consistently efficient performers with expenditures averaging 95% of available funds over the last ten fiscal years. Increasing use and development in the flood plains of the United States continue to increase demand for the flood hazard information, technical services, and planning guidance provided by this program. By working together with Federal, State, and local land use decision makers, we are able to identify the various flood hazards, reduce unwise development in the flood plains and avoid future losses to life and property. In FY 1987, with reduced funding, we will be able to respond to only about 65,000 requests, down some 17,000 responses from FY 1986. The $9.2 million in FY 1988 will increase our capability to fully respond to over 90,000 requests on potential flood plain improvements and development valued at over $11 billion. It will also enable use to increase our level of participation with the Federal Emergency Management Agency and local community responsiveness to the hurricane threat in the Gulf and Atlantic States. Data from several of these studies were used in September of 1985 by Civil Defense Directors to successfully evacuate extensive areas in Mississippi, Alabama, and Florida during Hurricane Elena. We are striving to complete as may of these studies as is practicable before another hurricane season is upon us.

Coastal Field Data Collection. The $2,200,000 requested for FY 1988 for this program is $400,000 more than the FY 1987 allocation. The additional $400,000 is needed to collect beach and nearshore data and continue the data collection for episodic events now that the R&D effort on techniques for collecting this data are complete. The goal of this program is to professionally accomplish our coastal engineering mission, including planning, design, construction, and operation and maintenance of coastal and lake navigation, flood control, and shore protection projects. The Corps requires a better understanding of severe storm and hurricane effects, and high-quality long-term data on: wind and wave climatology; tidal and longshore currents and water levels; erosion and accretion rates, and their manifestation as variations and trends in shoreline, beach profile, and nearshore bottom configurations; sediment characteristics, transport, and deposition; and other geographical and geomorphological parameters. Such data are generally not presently available, or are unreliable and of poor quality, or are statistically inadequate because they are too sparsely distributed with respect to time and place.

Ideally, the requisite records would already be at hand at each project site, and with adequate monitoring of local conditions continuing to provide the information needed for reconfirming, refining, and adjusting the baseline data. Such intensive coverage is not practical because of the prohibitive cost and the lead time required. For example, sufficient time is not available prior to or during the preauthorization and preconstruction phases of projects to accumulate the years of data required for adequate assessment of technical, economic, and environmental feasibility, and for consequent cost-effective project execution, and maintenance. Accordingly, the Corps has established the Coastal Field Data Collection Program that gathers and analyzes data on a regional basis and statistically enhances and extends this data base so that it can be made available for use on individual studies, projects, and other activities.

The data developed by this program has considerable applicability for interested Federal, State, and local agencies, and by the academic and private sectors. The related activities undertaken and the information produced by the entire community of interest in coastal engineering, climatology, and other facets of the coastal zone are mutually shared by all concerned. Also contributing significantly to extending our limited funding and manpower resources is our widespread use of wave forcasting models. Twenty years of directional wave data at about 10 mile intervals for the Atlantic, Pacific, and Gulf coasts of the United States are available. Work on similar data for the Great Lakes and an additional 10 year period (1976-1985) for all coasts is underway. We have also developed cooperative wave gaging efforts with the States of California, Florida, and Alaska. The State and Federal gages form a network with each responsible for funding its share and the data is shared. For California the seventeen gages have their data processed and published through the California system at Scripps Institute of Oceanography. We obtain data from eleven gages around the Florida coast from the University of Florida system. And in Alaska, three gages have been deployed and operated by the Corps with some initial funding assistance from the State.

INTERNATIONAL WATERS STUDIES. A total of $1,600,000 is requested for this activity in FY 1988 an increase of $1,500,000 over the FY 1987 allocation. These funds are required for Corps of Engineers field personnel assigned study responsibility to assist the United States Government in meeting obligations and commitments required under provision of treaties and other international agreements between the Governments of the United States and Canada. Such participation by the Corps and other agencies is essential in maintaining full coordination by all interests concerned in the regulation, control, and utilization of the boundary waters.

On 1 August 1986 the two Governments sent the International Joint Commission a reference (request for study) on the high Great Lakes levels. The reference calls for a comprehensive study of the Great Lakes Basin to examine and report upon methods of alleviating the adverse consequences of fluctuating water levels. The significant increase in requested funds will be used to fund Corps responsibilities in meeting the United States commitment to the study. The Great Lakes are currently in a high precipitation regime, compared with the early part of the century. In addition, the temperature of the basin has been about 1 degree celcius cooler for the past 25 years as compared with the previous 30 years. This decrease in temperature has reduced evapotranspiration. The result is higher water levels and the potential for significant damage losses. Corps activities in support of this reference for FY 1988 are the reason for the $1,500,000 increase in the request over last year.

## RESEARCH AND DEVELOPMENT

Our total budget request for the overall Corps Civil Works R&D program amounts to $35,025,000, or slightly over 1 percent of the Civil Works program for FY 1988. Our request for Research and Development under General Investigations is $21,500,000, an increase of $3,500,000 over the FY 1987 allocation. This increase reflects the Corps dedication to achieve greater efficiencies and economies in all its Civil Works mission areas. In addition, $13,525,000, an increase of $1,080,000 over the FY 1987 allocation, is included under other appropriation titles for R&D work closely related and integral to activities funded under those appropriations.

Our R&D is practical, field usable, and produces money and manpower savings. Particular emphasis in the Civil Works R&D program is being placed on procedures and techniques to help Corps designers, engineers, planners, managers, and operations personnel accomplish their jobs better and at less costs. It also keeps us up-to-date and is an important element in making the Corps a good cost sharing partner for local water resources project sponsors. The Civil Works R&D program is closely scrutinized and managed by me, my staff, and by the Engineering and Construction Directorate and the Research and Development Directorate. Our R&D has been producing early and continuing payoffs resulting from new technology applications, increased reliability and effectiveness, more assured safety, and better decision-making. During periods of tightly constrained Civil Works funding and reduced manpower, the R&D program is a critical Corps necessity for uncovering ways of doing more with less resources.

## ACTIVITIES UNDER THE CONSTRUCTION, GENERAL APPROPRIATION

### CONTINUING AUTHORITIES PROGRAM

The request for the six continuing authorities funded under Construction, General is $53,000,000, a decrease of $1,644,000 from the FY 1987 allocation. About 30% of the request covers funding of construction new starts, mostly to provide solutions to flood control and emergency streambank problems under the Section 205 and Section 14 programs. The remainder of the request will be used to initiate and continue planning and design, and to continue construction under these programs that consist of projects for navigation, flood damage prevention, beach erosion control, emergency streambank and shoreline erosion protection, and clearing and snagging.

The request for FY 1988 reflects continuation of changes we have made in both the management and priorities in the Continuing Authorities Programs in FY 1987. I refer to continuing to accord a high priority to meeting the major needs for flood damage protection, commercial navigation, and emergency bank protection where public facilities are threatened, and a low budget priority for primarily recreation projects. The Continuing Authorities Program decision document studies and projects will be in accordance with the provision of the Water Resources Development Act of 1986 (PL 99-662), comparable to specifically authorized feasibility phase studies and projects. The Continuing Authorities Program remains popular, and we are confident of our sustained success in implementing these programs in the future.

With regard to recreation-oriented studies and projects, we are not funding continuation of any activity in the Continuing Authorities Program for those projects which depend on separable recreation benefits for economic justification: In addition, except for Section 14 projects, no study or project with be funded if recreation benefits exceed 50% of total benefits.

## DAM SAFETY ASSURANCE

None of the over 600 completed Corps dams is in known imminent danger of failure. However, in the light of present scientific knowledge, engineering standards, and experience gained with respect to the potential for earthquakes and extremely large floods, we now believe that the risk for severe damage to or failure of some of these structures may be higher than originally anticipated. Forty seven dam projects appear likely to require selective modification to meet our current safety standards. The FY 1988 budget request for the overall Dam Safety Assurance program is $34,800,000, of which $9,800,000 is for continuation of construction for modification of four projects started in FY 1985 and FY 1986; and funds for these projects are included in the budget request for each applicable Division. The $25,000,000 balance of this budget request, the portion included under Remaining Items, is to be applied toward initiation of construction on additional Dam Safety Assurance new starts which may be approved in FY 1987 and 1988 as a result of studies now underway. This approach allows establishing priorities as the circumstances dictate.

## AQUATIC PLANT CONTROL

The nationwide Aquatic Plant Control program is budgeted for $8,500,000, an increase of $813,000 over the FY 1987 allocation. This is a cooperative Federal-state program, aimed at controlling aquatic weed infestations which have significant economic or environmental effects on the use of our waterways. Control of problem aquatic plants provides benefits for navigation, flood control, major drainage, agriculture, water-based recreation, fish and wildlife, and public health. The budgeted amount will permit needed planning and control operations in 21 states and Puerto Rico, and will permit continuation of our important aquatic plant research activities.

The FY 1988 request includes $2,300,000 for research, $512,000 for planning, and $5,688,000 for control operations. Costs for research and planning are 100 percent Federal. Control operations must be cost shared. The Water Resources Development Act of 1986 requires that non-Federal interests provide at least 50 percent of the cost of control operations. Control programs utilize various biological, chemical, and mechanical tools and techniques. The research component is aimed at improving the effectiveness, economics, and safety of control measures and their suitable combinations. About 1.6 million acres of the nations waters are infested with problem aquatic plants. The aquatic plant problem was at one time confined largely to the Southeastern States, but the problem has become an increasing concern in the Northwest, Northeast, and now in the Potomac River.

### EMPLOYEES' COMPENSATION

The request includes $13,478,000, an increase of $2,505,000 over FY 1987, for transfer to the Department of Labor to replenish the Employees' Compensation Fund for costs charged to that Fund during the period July 1, 1985 through June 30, 1986 for payment of benefits and claims on account of injury or death of Corps of Engineers employees carried under the Civil Works program.

## ACTIVITIES UNDER THE OPERATION AND MAINTENANCE, GENERAL APPROPRIATION

### MONITORING OF COMPLETED COASTAL PROJECTS

The request of $1,500,000 for Monitoring of Completed Coastal Projects, an increase of $500,000 over the FY 1987 allocation, will provide for the ongoing program of monitoring critical coastal engineering parameters of selected coastal projects to determine and analyze project-induced changes in topography, currents, waves, flushing characteristics, tidal stages, and other hydrodynamic phenomena. The data collected and analyzed are used to evaluate project performance in relation to design expectations and projected benefits, and to develop improved designs for coastal projects and desirable modifications in their operation and maintenance modes. In addition to serving Corps needs, this program is producing and disseminating data and information useful to other Federal, state, and local agencies concerned with planning and regulating the conservation, development, and use of coastal and offshore resources and values.

### DREDGING RESEARCH PROGRAM

Dredging is the largest element in the the Corps O&M budget, costing approximately $400,000,000 per year. There has been little or no applied research in the general area of dredging in recent years. Therefore, it is extremely fertile ground for a research program directed at producing significant cost savings. Stimulated by the imperatives of fiscal responsibility, we have formulated the components of a new Dredging Research Program that is included in our O&M budget. In short, the singular objective of the program is to substantially reduce the cost of dredging consistent with the Corps' mission performance requirements. This can be accomplished by:

A. Increasing efficiencies of processes, operations, and equipment.

B. Reducing the number of change orders through improved initial definition of operational requirements.

C. Reducing the economic impact of contract claims.

D. Sharing field operating offices successes in reducing costs throughout the Corps.

The Dredging Research Program is aimed at providing methods and techniques to meet these goals. Accordingly, we have included a request for $3,000,000 to initiate a planned 6-year, $35,000,000 program of practical, high pay-off dredging research.

### RIVER ICE MANAGEMENT (RIM) RESEARCH PROGRAM

The request for the last year of the six-year, $12,000,000 River Ice Management Research program is $1,150,000. This research is aimed at developing ice control techniques, including structural and operational solutions to ice problems in river systems, to permit cost-effective, reliable, and safe waterborne navigation throughout the year without adverse environmental effects. Ice-prone rivers, directly serving 19 states with 45 percent of the Nation's population, constitute a major physical impediment to winter navigation and could generate huge economic losses, particularly in areas dependent on year-round navigation. These rivers also serve as conduits to eight other river states and connect the U.S. heartland to worldwide markets through the Gulf of Mexico, the ports of the northwest, the Great Lakes, and the St. Lawrence Seaway. One of the major products of the River Ice Management program will be a new manual on Winter Navigation on Inland Waterways which will summarize in a readily applied manner all the findings and techniques derived from the program.

REPAIR, EVALUATION, MAINTENANCE, AND REHABILITATION (REMR) RESEARCH PROGRAM

We are requesting $6,835,000, for the fifth year of the six-year, $35,000,000 Repair, Evaluation, Maintenance, and Rehabilitation (REMR) R&D program. We are moving into the final phase of the REMR program and are producing a variety of practical, high-quality technology transfer products for use throughout the Corps and by the Bureau of Reclamation, TVA, and other Federal agencies, state and local governments, and the private sector. These include: a collection of technical notes on proven materials, methods, and equipment for repair, evaluation, and rehabilitation; the REMR Bulletin, an information bulletin relating field experience in maintenance and repair from around the Corps; a series of technical reports of results of major research findings; and a videotape showing how to use the latest REMR technology. We expect the new methods, materials, and techniques being produced by the program to provide significant cost savings in our Operation and Maintenance program.

PROTECTION OF NAVIGATION

The request for $6,830,000 under the protection of navigation heading provides for accomplishing the essential work and the administration and enforcement of specific laws, enacted in the interests of the protection of navigation for the removal of sunken vessels and other obstructions ($1,000,000); the protection, clearing, and straightening of channels of navigable waters not specifically authorized by Congress ($50,000); Surveillance of Northern Boundary Waters ($2,310,000) which include operational activities under provisions of treaties and international agreements for boundary waters of the United States and Canada; and the collection of domestic waterborne commerce statistics ($3,470,000) pertaining to rivers, harbors, and waterways, and compilation and publication of such data. In addition to funds for collection, compilation, and publication of data on domestic waterborne commerce, the amount requested includes funds to reimburse the Bureau of the Census for costs incurred in furnishing the Chief of Engineers complete port and waterway data on the foreign Waterborne Commerce of the United States. The data collected under this activity are essential to the U.S. Treasury Department as a basis for collection and enforcement of the value tax to be levied on commercial cargo as a result of enactment of the Water Resources Development Act of 1986.

## NATIONAL EMERGENCY PREPAREDNESS PROGRAM

The Corps of Engineers National Emergency Preparedness Program is an essential ingredient in the nation's overall mobilization and readiness posture. The Corps has the unique capability of being able to provide construction support throughout the world. Integral to this ability is the expertise and experience of the Civil Works personnel to mobilize for emergencies supporting the civil sectors or other Federal agencies. The program is a comprehensive effort to develop and maintain a capability to respond decisively and effectively to national emergencies. The program encompasses emergency planning functions beyond the expected military support mission and is responsive to our nation's needs resulting from national disasters such as major water shortages, catastrophic earthquakes, nuclear power plant or weapons accidents.

The FY 1987 allocation of $8 million was a reduction from our $13.5 million budget request. As a result, we have curtailed mobilization resources studies (Macro Analysis), new state water resources inventories, upgrading of existing and new command and control facilities such as the Emergency Operations Centers, Emergency Relocation Sites, and our level of participation in mobilization exercises.

The FY 1988 request of $10 million which is an increase of $2 million over the FY 1987 allocation will allow us to maintain our austere level of planning and maintenance of existing facilities, specifically, the development and updating of the necessary mobilization emergency preparedness plans, the training of personnel, conducting and participating in exercises and the maintenance and supply of emergency command and control facilities. Other activities include emergency water planning which will provide the Corps with the capability and posture to meet essential water needs during national security emergencies, maintaining existing emergency operations centers, assessment of the vulnerability and survivability of the Corps' command and control structure; and updating of the Corps requirements and capabilities during mobilization and national emergencies. The preparedness efforts, coupled with interagency liaison, are a vital and continuous process that is essential and must be encouraged to fortify national emergency preparedness programs throughout the nation.

## ACTIVITIES UNDER THE FLOOD CONTROL AND COASTAL EMERGENCIES APPROPRIATION

The budget request of $26,000,000 for Flood Control and Coastal Emergencies, under Public Law 84-99, provides funding for advance planning and preparedness activities and to meet the emergency operations requirements of a minimum response year, which is roughly equivalent to half our historic annual requirements for emergency response. The expanded authority provided under Section 917 of Public Law 99-662 may increase our requirements. The full extent of impact of this expanded authority is still under study within the Corps. In that event or in the event of major disaster, a supplemental request would be submitted.

In Fiscal Year 1986 Congress provided $25 million in supplemental funds after the disastrous flooding in California and other areas of the nation. Since that time $10 million has been allocated to the California area and $10 million dollars to the Great Lakes area.

Advance planning and preparedness activities include: review and updating of response plans; training personnel to ensure their capability to respond under adverse conditions; procurement and pre-positioning of equipment and supplies not likely to be readily available during the initial stages of response; periodic exercises to test and evaluate plans, personnel, and training; and overall management of the response program to ensure a workable and coordinated effort is undertaken and executed in a timely and effective manner.

## ACTIVITIES UNDER THE GENERAL EXPENSES APPROPRIATION

The FY 1988 budget request for General Expenses is $128,200,000, an increase of $10,000,000 over FY 1987. The General Expenses appropriation provides for the executive direction and management of the overall Civil Works program through the Office of the Chief of Engineers and the 11 Division Offices.

It also funds the Board of Engineers for Rivers and Harbors (BERH), the Coastal Engineering Research Board (CERB), a portion of the Engineer Automation Support Activity (EASA), and a portion of the Water Resources Support Center (WRSC). The appropriation provides funds for 1,725 civilians and 80 military officers in these activities. The goal of the program is to assure that definitive policy guidance, direction, management and coordination is provided for all Corps activities toward execution of a comprehensive Civil Works program.

The FY 1988 budget request increase is based on additional known costs in personnel salaries and benefits, rent, communications, ADP software conversion, training for civilians, and printing. A total of $4,500,000 is for increased personnel costs resulting from the January 1987 pay raise and the new Federal Employees' Retirement System. The actual number of civilian and military officer positions funded by General Expenses will remain at the FY 1987 level.

Standard Level User Charges (SLUC) established by the General Services Administration (GSA) for rent and utilities are estimated to increase by $1,000,000 due to the current escalation of property value in the Washington, D.C. area and in the large metropolitan areas where Corps division offices are located. Also, communication costs are expected to increase by $1,100,000 as a result of the GSA mandated purchase of telephone equipment used in the Federal Telecommunications System (FTS), and the conversion of FTS costs within the Corps from assigned personnel strength to actual usage.

In the ADP area, an additional $2,900,000 is requested for the General Expenses share of software conversion costs associated with the Congressionally approved Corps of Engineers Automation Plan (CEAP).

Training costs will increase slightly over the current level to fund a new training activity that will enhance leadership development for Corps civilian managers. Also, the passage of the Water Resources Development Act of 1986 (P.L. 99-662) will require the revision of many regulations and other publications of the Civil Works program. We believe that the new training activity, and printing and reproduction costs associated with P.L. 99-662 will amount to about $400,000.

Travel costs have been constrained to the FY 1986-87 budget levels. The program will absorb the higher Federal per diem travel rates that went into effect on 1 July 1986, by reducing the number and length of trips.

## CIVIL WORKS FOREIGN TRAVEL

An Army objective in managing Civil Works funded foreign travel in Fiscal Year 1987 is to achieve a reduction in expenditures to the 1983 spending level of $276,000 in accord with the guidance set forth in the House of Representatives colloquy, Congressional Record of July 23, 1987, page 4745. The total Civil Works funded foreign travel by Corps personnel in Fiscal Year 1986 was $305,373. This total is a decrease of nearly 25 percent from the Fiscal Year 1985 spending level of $406,638.

Civil Works funded foreign travel includes travel in support of the following: treaties between the U. S. and foreign governments; Department of State approved executive agreements between the Department of the Army and foreign agencies on scientific and technological exchanges; authorized projects; joint research programs; participation on behalf of the U. S. Government in various international organizations; and attendance of Corps scientists and engineers at professional meetings, conferences, and workshops.

The Corps is in the process, and has been for almost a year, of systematically addressing foreign activities and foreign travel issues. During this period, we have set forth prior approval and reporting requirements for foreign travel. These and other management efforts, including close coordination of all our international activities with the Department of State, have helped to further discipline and guide this activity.

In future years, we will continue to manage Civil Works funded foreign travel within a budget constraint, assigning priorities within a predetermined budget and examining travel which does not benefit the Army's Civil Works mission.

## REVOLVING FUND--PLANT REPLACEMENT AND IMPROVEMENT PROGRAM

Our FY 1988 Plant Replacement and Improvement Program (PRIP) expenditures under the Revolving Fund, for items designed to increase productivity, reduce costs, compensate for reductions in manpower, modernize and improve our equipment and operational capabilities, and increase safety, are estimated at $89,000,000. This includes $15 million appropriated in FY 1986 and FY 1987 for two major items, a replacement dustpan dredge and the Corps of Engineers Automation Plan (CEAP). No new budget authority is requested for these items in FY 1988 because of slippages.

The remaining $74 million of PRIP expenditures will be financed from the income generated by the rental charges for the use of our plant and equipment. $4,660,000 has been programmed for four new major items: $2,000,000 to design and initiate construction of a new office building for the Galveston District; $1,300,000 to complete design and initiate construction of a replacement for an obsolete laboratory building for the Ohio River Division; $660,000 to complete design and construction a replacement general purpose vessel for the St. Louis District; and $700,000 to design and initiate construction of a flat deck spud barge for the Nashville District. $57,000,000 has been programmed for the acquisition of the following major items of plant and equipment that were previously justified to the Committee: $400,000 to initiate construction of additions and improvements to the Coastal Engineering Research Center Headquarters building at the Waterways Experiment Station (WES); $2,500,000 to continue construction of the Automatic Data Processing Center at WES; and $4,900,000 to complete construction of the Walla Walla District office building; $1,000,000 to complete design and initiate construction of the new minimum fleet sidecaster dredge for the Wilmington District; $1,250,000 to complete construction of a crane barge for the Mobile District; $1,500,000 to acquire a 65 foot offshore surveyboat for the Norfolk District; $950,000 to complete construction of a towboat for the Rock Island District; $2,500,000 to complete construction of a derrickboat for the Huntington District; $1,150,000 to complete construction of a survey vessel for the Jacksonville District; $1,200,000 for continuation of Water Control Data Systems upgrades; $4,710,000 to continue upgrading the Corps-wide radio communications system; and $10,000,000 for the acquisition of microcomputers, graphics display terminals, and other general-purpose office automation equipment. $27,340,000 has also been programmed for design, rehabilitation, construction, acquisition, additions and improvements of miscellaneous items of plant and equipment with a total cost of less than $700,000, each.

## TRANSFER BUDGET REQUEST FOR FY 1987

For FY 1987, an additional $3,200,000 in the General Expenses appropriation is required to cover increased costs of the Federal pay raise and the new Federal Employees' Retirement System. We propose that $3,200,000 be transferred from the FY 1987 Construction, General account to the FY 1987 General Expenses account.

The General Expenses appropriation cannot absorb the $3,200,000 increased personnel costs without significant impact on its primary function of executive direction and management of the overall Civil Works program. The major portion of the General Expenses costs are for on-board personnel salaries and benefits. The amount of discretionary funds in the General Expenses account are very limited. Further, enactment of the Water Resources Development Act of 1986 will require substantial increased effort in the Office, Chief of Engineers and in other General Expenses activities to perform reviews, initiate studies and conduct additional unfunded work.

The total cost of Federal pay raises for the Corps Civil Works program in FY 1987 is $22,500,000. The increased costs of Corps Civil Works program contributions for employee retirement under the new Federal Employees' Retirement System in FY 1987 is $14,900,000. Except in the General Expenses appropriation the Department of the Army proposes to absorb the full increase in personnel costs of $37,400,000. The following is breakdown of the increased personnel costs by account:

| Appropriation | Retirement | Pay Raise | Total |
|---|---|---|---|
| General Investigations.............. | $1,400,000 | $1,800,000 | $3,200,000 |
| Construction, General............... | 3,100,000 | 5,800,000 | 8,900,000 |
| Operations & Maintenance, General.... | 7,400,000 | 9,900,000 | 17,300,000 |
| Mississippi River & Tributaries...... | 1,500,000 | 2,700,000 | 4,200,000 |
| General Expenses..................... | 1,400,000 | 1,800,000 | 3,200,000 |
| Flood Control & Coastal Emergencies.. | 100,000 | 500,000 | 600,000 |
| Totals........................ | $14,900,000 | $22,500,000 | $37,400,000 |

## CONCLUSION

Mr. Chairman, this concludes my summary remarks. I would now like to present a brief slide presentation on our R&D activities, highlighting a few of the accomplishments and contributions toward executing our Civil Works with greater effectiveness, safety, and economy.

## RESEARCH & DEVELOPMENT

We are departing somewhat from our usual R&D briefing to bring several items to your attention: some accomplishments and benefits of the Civil Works R&D program, a problem concerning our R&D funding, and problems concerning research in the construction industry nationwide.

First, I would like to report to you on accomplishments in Civil Works Research and Development. We have been examining the benefits this program has provided over the last ten years and have developed many specific examples of savings. I would like to cite just a few.

o Regional Development Impact Assessment Model

Through our planning methodologies research program, we have produced regional development impact models to estimate changes in employment and personal income attributable to construction of water resource projects. The identification of these effects has helped to communicate the benefits of water resource investments to our non-federal cost sharing partners. This technique has reduced the cost of such studies by approximately 50 percent and saved $5 million.

o Water Demand Forecasting Model

A state-of-the-art water demand forecasting model, IWR-MAIN, has been developed for the microcomputer to provide the Corps with the capability to make accurate water supply needs assessments required to make prudent investment decisions for future municipal and industrial water supply for Corps multi-purpose projects. The added accuracy has helped avoid costly mistakes which can result from either over or under investment in water supply capacity. Use of IWR-MAIN has reduced by 40 percent the cost of performing these studies and resulted in savings of $3.6 million.

- Floating Breakwater Structural Design

  New design criteria for floating breakwaters were developed through research and used recently in the design of two breakwaters in the State of Washington. Cost savings of $1.7 million were obtained using the new criteria rather than conventional design.

- Seismic Safety Evaluation

  Seismic safety evaluation of on earth dam involves many borings, laboratory tests and computer studies. Overall costs range $500,000 to $2. million per dam. For some dams these costs can be avoided if it can be shown that an earthquake will induce only a small sliding displacement. A quick, inexpensive screening method was developed to estimate displacement and distinguish sure, safe dams from those requiring more costly study. At least 30 dams have been screened resulting in savings of $15 million when it was found that only one-third required the more expensive analysis.

- Roller Compacted Concrete

  The Corps lacked procedures to use emerging technologies to more economically place mass concrete. We developed procedures for using Roller compacted Concrete and used them on the Willow Creek dam which provided a savings of $11 million on that structure alone. Additionally, we are saving in excess of $12 million on Elk Creek Dam presently under construction.

- Increased Capacity of Dredged Material Containment Areas

  We have developed improved methods to manage Corps upland dredged material containment areas. Our R&D has provided new consolidation, dewatering, and design techniques to increase the capacity by

50 percent of existing and new dredged material containment areas. This has resulted in cost savings of $350 million for local sponsors and federal interests.

These examples, I believe, concretely demonstrate the effectiveness and practicality of the Federal investment in Civil Works R&D.

These accomplishments are good news and we are proud of them. However, the benefits just described are dependent on being funded sufficiently to meet the challenge of continued savings for the taxpayer and to seek even greater savings and efficiencies in the cost sharing era for water resource projects just now beginning. The downward trend in funding has left the program almost 40 percent lower in FY 87 than FY 80 in terms of FY 87 constant dollars. Based on our record of accomplishment it can be said that these reductions may have resulted in missed opportunities to save federal dollars.

The reductions in Civil Works R&D just noted are of concern when viewed against the background of research and productivity in the construction industry in the U.S. A just published report by the National Research Council entitle "Construction Productivity" documents falling productivity and a level of R&D investment that is in the bottom rank of mature industries. Because of the decentralized nature of the industry and other factors the report calls for an increase in federal funding of construction R&D. The report was sponsored by the Federal Construction Council and concludes that federal self-interest alone could justify greater federal involvement in sponsoring construction-related research.

In summary, we have requested an increase of $4,580,000 in the total Civil Works R&D budget. $3,500,000 is in the General Investigations appropriation and the remainder in other appropriations to better address the concerns I have set forth in my remarks.

### INTRODUCTION OF SUPPORTIVE WITNESSES

General HATCH. Mr. Chairman, I am honored to make this appearance before you as Director of Civil Works to cover the remaining items. With your permission, I will begin with summary remarks, and provide a more detailed statement for the record.

With me today, from my staff and other directorates within the headquarters, are Mr. Don Cluff, Chief of the Programs Division; Mr. Bill Lockwood, Assistant Chief of our Policy Division; Mr. Cecil Goad, Chief of our Operations and Readiness Division; Mr. Dan Mauldin, Chief of our Planning Division, who has just joined us from the South Atlantic Division; Mr. Bill Murden, Chief of our Dredging Division.

With me from other directorates are Mr. Lloyd Duscha, who is, I might add, the senior civil servant in the Corps of Engineers, and the Deputy Director of the Engineering and Construction Directorate; Mr. Bill Roper, the Assistant Director of Research and Development; and Mr. Richard Colver, the Deputy Director for Information Management.

I might add as a footnote, Mr. Chairman, you can see I seem to need more help than our field commanders in this presentation. [Laughter.]

### REMAINING ITEMS OVERVIEW

I would like to highlight some of the fiscal year 1988 budget request for remaining items, which includes our nationwide programs and activities not covered by the Division Engineers. These also include the general expenses appropriation, which funds executive direction and management of the civil works program.

I will touch on major items of plant and equipment proposed for procurement under the revolving fund, and also briefly discuss the transfer budget request for fiscal year 1987, which involves the transfer of construction, general funds to the general expenses appropriation. Following these, I will present a brief overview and representative sampling of some of our current R&D activities and recent accomplishments.

The total remaining items in the budget request is $328 million, of which $45.4 million is for general investigations, $99.9 million is for construction, general, $29.3 million is for operation and maintenance, $26 million is for flood control and coastal emergencies, and $128.2 million is for general expenses.

### GENERAL INVESTIGATIONS

The major items under general investigations include: cooperation with other federal agencies, states, and nonfederal interests, $7.6 million; collection and study of basic data, $15.2 million; and research and development, $21.5 million.

### FLOOD PLAIN MANAGEMENT SERVICES

The flood plain management services program is the most important nonproject service that the Corps provides to local populations and the general public. It is the largest portion of the collection and study of basic data request at $9.2 million. This program is one of our most consistently efficient performers with expenditures averaging 95 percent of the funds you have made available.

Through extensive interagency coordination, we have carefully directed the efforts of this program to compliment, rather than to duplicate, the activities of other agencies such as the Federal Emergency Management Agency's administration of the national flood insurance program. However, demand for the flood hazard information, technical services, and planning guidance provided by our flood plain management services program continues to increase because of the increasing use and development of the flood plains in the United States. By working together with federal, state and local land use decisionmakers, we are able to identify the various flood hazards, reduce unwise development in flood plains and avoid future losses of life and property.

### INTERNATIONAL WATERS STUDIES

The funds for international waters studies are required for Corps of Engineers field personnel to assist in meeting obligations and commitments required by treaties and other international agreements between the governments of the United States and Canada. Such participation by the Corps and other agencies is essential in maintaining full coordination by all interests concerned in the regulation, control, and utilization of the boundary waters.

In August 1986, the two governments sent the International Joint Commission a reference, which is a request for study, on the high level of the Great Lakes, as discussed by General Pratt in his status report. The reference calls for a comprehensive study of the Great Lakes basin which would examine and report upon methods of alleviating the adverse consequences of fluctuating water levels. The significant increase in requested funds will be used to cover the Corps' share of this study cost.

### CONSTRUCTION, GENERAL

The $99.9 million request for construction, general items, includes $53 million for six small project programs under our continuing authorities, $25 million for the dam safety program, $8.5 million for aquatic plant control, and $13.4 million for employees compensation payments to the Department of Labor.

### CONTINUING AUTHORITY PROGRAM PRIORITIES

The request for continuing authorities in 1988 reflects continuation of changes we have made in both the management and priorities of that program in fiscal year 1987. I refer to continuing to accord a high priority to meeting the major needs for flood damage protection, commercial navigation, and emergency bank protection where public facilities are threatened, and, frankly, a low budget priority to primarily recreation projects.

Continuing authorities program studies and projects will be developed consistent with the cost-sharing provisions of the Water Resources

Development Act of 1986. Contrary to the information presented in the justification sheets for affected fiscal year 1987 and 1988 new construction starts, for flood control projects, railroad bridge relocation costs will continue to be considered a part of project construction costs. The continuing authorities program remains popular, and we are confident of our sustained success in implementing these programs in the future.

### OPERATION AND MAINTENANCE, GENERAL

Under operation and maintenance, we have budgeted $29.3 million for several items. I will briefly discuss one research item, the new dredging research program and the National Emergency preparedness program.

### DREDGING RESEARCH

Dredging is the largest element in the Corps O&M budget, costing approximately $400 million per year. There has been little or no applied research in the general area of dredging in recent years. Therefore, it is extremely fertile ground for research programs such as the dredging research program. Its sole objective is to substantially reduce the cost of federal dredging.

### NATIONAL EMERGENCY PREPAREDNESS

The fiscal year 1988 request of $10 million for the national emergency preparedness program will allow us to maintain our austere level of planning and maintenance of existing facilities. Specifically, the funds will be used to develop and update mobilization emergency preparedness plans, train personnel, conduct and participate in exercises, and maintain and supply emergency command and control facilities.

Other activities include emergency water planning, which will provide the Corps with the capability to meet essential water needs during national emergencies, assess the vulnerability and survivability of the Corps' command and control structure, and update the Corps' requirements and capabilities to respond in the event of a mobilization or other national emergency.

### GENERAL EXPENSES

The fiscal year 1988 request for general expenses is $128 million to provide for the executive direction and management of the overall civil works program, including offices of the Chief of Engineers and the 11 Division offices, the Board of Engineers for Rivers and Harbors, the Coastal Engineering Research Board, a portion of the engineer automation support activity, and a portion of the Water Resources Support Center.

### PLANT REPLACEMENT AND IMPROVEMENT PROGRAM

Our 1988 plant replacement and improvement program [PRIP] expenditures under the revolving fund are estimated at $89 million. Because of slippages, two major items, the replacement of a dustpan dredge and the Corps of Engineers automation plan, are being financed in fiscal year 1988 from funds appropriated by the Congress in prior years. Therefore, no new budget authority is being requested for fiscal year 1988.

The total fiscal year 1988 PRIP expenditure of $89 million includes $15 million previously appropriated for the above items and $74 million which will be financed from the income generated by the revolving fund rental charges for the use of our plant and equipment.

## GENERAL EXPENSES

For fiscal year 1987, an additional $3.2 million in the general expenses appropriation is required to cover increased costs of the federal pay raise and the new federal employees retirement system. We propose that $3.2 million be transferred from the fiscal year 1987 construction, general, account, to the fiscal year 1987 general expenses account. The total cost of federal pay raises for the Corps civil works program in fiscal year 1987 is $22.5 million.

The increased cost of Corps civil works program contributions for employee retirement under the new federal employees retirement system in fiscal year 1987 is $14.9 million. The Department of the Army proposes to absorb the full increase in personnel costs of $37.4 million, except that some relief is necessary in the general expenses appropriation.

## RESEARCH AND DEVELOPMENT PROGRAM

Mr. Chairman, this concludes my summary remarks. I would like now, with your permission, to present a brief slide presentation on our R&D activities, highlighting a few of the accomplishments and contributions toward executing our civil works with greater effectiveness, safety and economy.

We are departing somewhat from our usual R&D briefing to bring several items to your attention. Some accomplishments and benefits of the civil works R&D program, a problem concerning our R&D funding, and problems concerning research in the construction industry nationwide.

First, I would like to report to you on accomplishments in civil works research. We have been tracking the benefits that this program has provided over the last few years and have many specific examples of savings. I would like to cite just a few.

Through our planning methodologies research program, we have produced models to estimate changes in employment and personnel income we can attribute to construction of water resource projects. The identification of these effects has helped to communicate the benefits of water resource investments to our nonfederal cost-sharing partners. This technique has reduced the cost of such studies by approximately 50 percent and saved $5 million.

New design criteria for floating breakwaters were developed through research and used recently in the design of two breakwaters in the state of Washington. We saved $1.7 million using the new criteria.

### ROLLER-COMPACTED CONCRETE

Before 1978, the Corps lacked procedures to use emerging technologies to more economically place mass concrete. We developed procedures for using roller-compacted concrete and used them on the Willow Creek Dam which saved $11 million on that structure alone.

Additionally, we are saving in excess of $12 million on Elk Creek Dam presently under construction. I might add that this is an example of a technology that we have incorporated into our processes. We are also using roller-compacted concrete in our military programs for considerable savings for hard stands and similar structures.

### CONCRETE DETERIORATION

Senator JOHNSTON. General, I am very interested in concrete and its deterioration. I saw not too long ago, in the Virgin Islands, some old sugar mills where the concrete holds together just as firm—I say concrete, but it was some sort of cement mixed with some kind of coral. It seemed to be hard, firm, and solid, even though it is bathed frequently by rain and subjected to all of the stresses of the hot weather down there. On the other hand, you see bridges that are deteriorating before your eyes like the bridges over the Potomac, and the concrete turning into powder. What causes that?

I asked the question the other day, and they said that it is the difference in weather, but there has to be more to it than that. Isn't there something about the chemistry of concrete that causes different rates of deterioration?

General HATCH. Sir, I will defer in a moment to both our research and development folks, and Mr. Duscha from Engineering and Construction.

I believe it is a fairly complex answer, which has, in part, to do with the evolving state-of-the-art in the development of concrete structures, the placement of concrete, and the introduction of air and other techniques to enhance the life. Also, it is a function of the exposure to not only changes in temperature, but also chemicals. For example, the presence or absence of salt on highways perhaps has an effect on it. There are many, many reasons for that differential in the deterioration of concrete that you have seen.

I have also seen concrete poured by the Japanese on some of our islands in the Pacific during the World War II, using salt water, which we don't do, as a source of water, and that concrete, in some cases, has held together very well, and right on the same island, it has completely crumbled and fallen apart. The actual placement itself, how it is done physically, has something to do with how the concrete will stand up. Quality control in the mix has something to do with it. There are many, many variables.

I would invite Dr. Roper or Lloyd Duscha to add to that.

Mr. DUSCHA. Yes, Mr. Chairman, General Hatch did an admirable job on that. The only thing I would add is that when we talk about temperatures, it is the change in temperature cycles that you have, and how many times you go through a freeze-and-thaw cycle which contributes to the well-being of the concrete.

The other aspect which must be taken into account is the chemical content of the aggregates you have to use in some places, which would tend to accelerate deterioration in some places, and help it in other places.

Senator JOHNSTON. It is more a question of the stress, either chemical, temperature, vibration, or whatever, rather than the initial chemical makeup of the concrete that determines its deterioration rate; would that be correct?

Mr. DUSCHA. The aggregates will determine what you have as a chemical makeup of the original concrete. In some places, you are unable to get aggregates which are totally free of reactive properties, so you have to use what you have for economic purposes.

If you get an aggregate without reactive properties, and you put in a good cement, you shouldn't have any trouble, but then you will have the problems of the freeze and thaw cycles, and things of that nature in the ensuing years, and the salt, as General Hatch mentioned, is one of the biggest problems that you face.

Senator JOHNSTON. Thank you.

### DREDGED DISPOSAL CONTAINMENT AREAS

General HATCH. We have developed improved methods to manage Corps upland dredge material containment areas. Our R&D has provided new consolidation, dewatering, and design techniques to increase the capacity by 50 percent of existing and new dredged material containment areas.

This is an aerial overview of Craney Island, Norfolk, Va. I might add, Mr. Chairman, in most cases, depending on the authorization language of a particular project, the provision of these sites is a local responsibility. Therefore, we can increase the capacity to clearly extend the useful life of these sites and, hopefully, hold down the cost to local interests.

Senator JOHNSTON. You are building an island there with dredged material?

General HATCH. Yes, sir. This is an aerial view of an island, and you can see three major sections of it. It has been divided up so that you can add material in one place, let it dry, let it drain, consolidate, and perhaps even compact it, let it sit for a while, and then go over to another area.

In the past, we used to just pump the material there and just let nature take care of it. As we ran out of sites, and the location of sites became an environmental as well as an economic challenge to local interests, we realized that we owed to them and us to try to be a little more efficient in the use of these locations.

Also, I might add, if we do that management, there is a higher probability that that site may be of some use later. If we control the consolidation, perhaps it might provide an industrial site, or some other purpose. This particular program has resulted in cost savings of $350 million for local sponsors and federal interests.

These examples, I believe, concretely demonstrate the effectiveness and practicality of the federal investment in civil works R&D.

### RESEARCH AND DEVELOPMENT FUNDING

While these accomplishments are good news, and we are proud of them, the benefits just described are dependent on being funded sufficiently to meet the challenge of continued savings for the taxpayer and to seek even greater savings and efficiencies in the cost-sharing era for water resource projects just now beginning.

This chart shows graphically what has happened to civil works R&D funding since 1980. The dark lines are the funded dollars, the then year dollars, the lighter lines are those same dollars expressed in terms of fiscal year 1987 buying power. This downward trend has severely impacted the program and its proven ability to provide savings for the taxpayer. Based on our record of accomplishment, it can be said that these reductions may have resulted in missed opportunities to save federal and local dollars now and in the future.

The reductions in civil works R&D just noted are of concern to us when viewed against the background of research and productivity in the construction industry in the United States. A just published report by the National Research Council, entitled, "Construction Productivity," documents falling productivity and a level of R&D investment that is in the bottom rank of mature industries.

Because of the decentralized nature of the industry and other factors, the report calls for an increase in federal funding of construction R&D. The report was sponsored by the Federal Construction Council and concludes that federal self-interest alone, for example, our program alone could justify greater federal involvement in sponsoring construction-related research.

I must point out that although we recognize this report, and what it has to say, we are not requesting funds to provide a broader federal R&D capability to serve the balance of the public and private sector. On the other hand, in our funded activities, we will seek opportunities to transfer that technology as appropriate, but we do not take on as purposes, the purposes that this report calls for.

In summary, we have requested $35 million to fund the civil works R&D program in fiscal year 1988.

Sir, this completes my prepared presentation, I am now prepared to respond to your questions.

### PURPOSE OF R&D PROGRAM

Senator JOHNSTON. Do you think that a major purpose of the R&D program is the balance of the public and the private payoff?

General HATCH. Sir, the R&D program that we have, as far as I am concerned, the civil funded portion, has as its sole purpose to enhance the efficiency and effectiveness of the civil works program that this committee has oversight for. If the other public sectors and the private sector can take advantage of that, that is just super. I might add that on a reimbursable basis, our laboratories do work for other public sector entities, and that helps to maintain our momentum and our technical capability.

We are not requesting funds from this committee to take care of some other role.

Senator JOHNSTON. In your view, is it a major payoff for the private sector?

General HATCH. I believe that it is a major payoff; yes, sir.

### MANAGEMENT OF R&D PROGRAM

Senator JOHNSTON. What management changes has the Corps made over the past year to provide more critical evaluation and review of ongoing and proposed R&D? Have there been any changes?

General HATCH. One of the principal changes, sir, is the enhancement, on the civil works side, of a system that provides, out of my office, technical monitors for each of the line items in the R&D program. Frankly, as the proponent for the civil works program, as a customer of R&D activities, I want to make awfully certain that every dollar that is being spent, that this committee appropriates, is in fact contributing to the civil works program. I personally participate in that review. I can't say exactly what happened in the past. We are going to hold their feet to the fire.

### RESEARCH AND DEVELOPMENT EQUIPMENT

Senator JOHNSTON. What new R&D facilities or equipment are requested in this budget?

General HATCH. Do you have that at the tip of your tongue, Dr. Roper?

Dr. ROPER. Yes, sir. There is some new equipment, laboratory type of equipment, that will be included for the waterway experiment station.

Senator JOHNSTON. Any major equipment?

Dr. ROPER. This would be primarily enhancement in the coastal engineering area, and the other specific things I would be glad to provide for the record, but that is the one that comes to mind.

General HATCH. Sir, if I may suggest, for the record, we might provide a list of the more expensive or the larger items that would be included.

### DAM SAFETY ASSURANCE PROGRAM

Senator JOHNSTON. The dam safety assurance program has gone from a level of $4 million in 1986 to a requested level of $32 million in fiscal year 1988. As was the case last year, the Congress is again being asked to appropriate a large sum of $25 million for unspecified work that may be approved.

First, how do you see the funding request for dam safety assurance changing over the next 5 years; and why should Congress provide $25 million with no idea of how the funds will be applied?

General HATCH. Sir, I will ask Mr. Duscha to address that first. He is our Dam Safety Officer for the Chief of Engineers.

Mr. DUSCHA. Mr. Chairman, we have a number of ongoing studies where we are evaluating our dams primarily from the standpoint of hydrologic capacity and the ability to withstand seismic conditions. With those studies that we foresee, and the stage they are, we perceive a number of projects coming to the front in 1988 for which we will need money to do the rehabilitation and the correction work that we foresee will come out of these studies.

Basically, right now, we are looking at a number of projects that we feel will emerge from this throughout the United States, ranging from Tenkiller in Oklahoma to Waco in Texas, and a couple of projects in Ohio.

Senator JOHNSTON. Can you identify those for us?

Mr. DUSCHA. Yes.

Senator JOHNSTON. If you would do that for the record, we would appreciate that. Also, I have some additional questions that you can answer for the record.

[NOTE: The following questions were not asked, but were made part of the hearing record for response by the Corps.]

## Questions Submitted by Senator Johnston

### REVIEW FOR DEAUTHORIZATION

Chairman JOHNSTON. Please explain why the Corps needs $500,000 to prepare a list of authorized unconstructed projects or separable elements of projects for which no funds have been obligated for construction.

General HATCH. Prior to the Water Resources Development Act of 1986, Public Law 99-662, deauthorization reviews were conducted under the Water Resources Development Act of 1974. These Acts differ in two significant respects, under the 1974 Act projects were considered for deauthorization if not funded for an eight year period, but were recommended for deauthorization only if a review of their merits showed deauthorization was warranted. Under Public Law 99-662, projects will be considered for deauthorization if not funded for a ten year period but deauthorization will be automatic if they are not funded by December 31st 1989, for the first list and within 30 months for subsequent lists. Section 1001 of Public Law 99-662 states that not later than one year after the date of enactment, which will be November 17th 1987, the Secretary shall transmit to Congress a list of unconstructed projects, or unconstructed separable elements of projects, which have been authorized, but have received no obligations during the 10 full fiscal years preceding the transmittal of the list. Projects on this list will be deauthorized after December 31st, 1989, if no funds have been obligated for construction between transmittal of the list and December 31st. We have requested the $500,000 for Fiscal Year 1988 to review the merits of projects that will be subject to deauthorization on December 31st 1989.

Chairman JOHNSTON. What has been the average level of expenditures for Review for Deauthorization over the past 10 years?

General HATCH. The average level of expenditures for Review for Deauthorization over the past 10 years has been a bit over $103,000 annually, and the last three years we have averaged slightly more than $143,000 annually. I might note that in the three year period after passage of the 1974 Act, expenditures for these reviews averaged just over $300,000 annually.

### COORDINATION AND STUDIES WITH OTHER AGENCIES

Senator JOHNSTON. How much of the $3,650,000 requested for special investigations under Coordination and Studies with other agencies is for each of the 4 subitems listed? How does this compare with the last 5 years of record.

General HATCH. Sir, of the four subitems set forth in the justification, only for the review of preliminary permit and license applications for non-Federal hydroelectric power development have funds been separately allotted to our FOA's. The Chief of Engineers has not authorized any detailed studies under this account, nor are any currently contemplated. I will provide a tabulation for the record of the distribution of the funds. The amount for Review of Reports and EIS is based upon estimates supplied by our FOA's.

(The Information Follows):

SPECIAL INVESTIGATIONS
(Dollars in Thousands)

| Item | FY 83 | FY 84 | FY 85 | FY 86 | FY 87 | FY 88 |
|---|---|---|---|---|---|---|
| Nominal Scope Investigations and Reports | 1,477 | 1,358 | 1,224 | 1,318 | 1,827 | 2,450 |
| Detailed Scope Investigations and Reports | 0 | 0 | 0 | 0 | 0 | 0 |
| FERC licensing | 342 | 550 | 427 | 385 | 395 | 400 |
| Review of Reports and EIS | 650 | 678 | 742 | 794 | 773 | 800 |
| TOTAL | 2,469 | 2,586 | 2,393 | 2,497 | 2,995 | 3,650 |

## FLOOD PLAIN MANAGEMENT SERVICES

Chairman JOHNSTON. General, your statement indicates that the Flood Plain Management Services program is the most important non-project service the Corps provides. What is the basis for making this statement?

General HATCH. As you know, since the 1930's we have controlled floods and reduced flood damages by constructing structural measures. In this manner we have dealt with the flood hazard after it became a problem. Under the Flood Plain Management Services Program, we undertake preventive measures by providing detailed information on flood hazards as well as technical assistance on how to deal with flooding. This information is critically needed by Federal, state, and local land use decision makers so that flood conditions can be considered when they take actions that relate to the flood plain. Since its inception, the Flood Plain Management Services Program has yielded large "returns" in the form of reducing unwise development in the flood plains. This not only avoids future losses to life and property but also reduces the need for costly structural flood control works as well as the demand for other government services such as providing disaster assistance during and following floods. Thus, the Corps Flood Plain Management Services Program provides a unique and significant service to our Nation.

Chairman JOHNSTON. What kinds of information and service are provided by the Corps?

General HATCH. Through our Flood Plain Management Services Program, the Corps provides a full range of technical services and planning guidance within the broad concept of flood plain management. Technical services activities consist of obtaining or developing and interpreting flood and flood plain related data. This includes information on flood timing; the depths, extent, duration, and frequency of flooding; and flood loss potentials before and after employment of flood plain management measures. Planning guidance activities consist of providing assistance for implementing or meeting the requirements of flood plain regulations, flood warning and emergency preparedness systems, flood proofing and permanent evacuation and relocation measures, the National Flood Insurance Program, and Executive Order 11988 on Federal Flood Plain Management. Additionally, we work closely with the Federal Emergency Management Agency and the National Weather Service in conducting joint Hurricane Evacuation Studies for coastal high-hazard areas. This extensive effort, encompassing the Gulf and Atlantic coastal states, provides detailed technical data to state and local emergency managers for their use in planning for the orderly evacuation of millions of residents and vacationers from vulnerable coastal areas.

Chairman JOHNSTON. Is this an activity where some of the cost could be recovered through a charge for services?

General HATCH. At the request of the Office of Management and Budget, we made a thorough investigation of user fees for the Flood Plain Management Services Program in 1981, and of cost recovery in 1982, and found neither to be advisable. The large number of services provided under the program each year makes it administratively costly to recover fees. In many cases, the estimated recovery costs were more than the costs of the service provided. Additionally, services are provided upon request and without charge as an inducement for those considering development in and near the flood plain to seek assistance. The added charge for Corps assistance would discourage somewhat the use of this important service and in some instances perpetuate development in the flood plains without adequate knowledge of the flood hazard. I might add that, in a sense, the program is already cost-shared in that requesters historically have sought services as a component to their own planning process. Many have, in fact, already incurred a major share of the planning costs before coming to the Corps for assistance.

Chairman JOHNSTON. Just why is a nearly 50% increase over the current funding level warranted?

General HATCH. One measure of the effectiveness of the Flood Plain Management Services Program is the magnitude of the demand for its services. A strongly increasing demand indicates a strong willingness by Federal, state and local decision makers to seek out and use our assistance. The more requests that we respond to, the greater the reduction in potential future flood damages. We have tried to maintain a reasonable response capability based on a frugal balance between the growing demand for services and the level of funding as requested in the President's Budget. Appropriations, however, were $1 million less than requested in FY 1985, $1 million less than requested in FY 1986, and $2.5 million less than requested in FY 1987. The nearly 50% increase over the current funding level is an attempt to close the gap between demand and funding.

Chairman JOHNSTON. What would be the impact if this activity were funded at the average level over the past five years of $6,600,000?

General HATCH. The most significant impact would be the opportunities foregone. At $6,600,000 we would be unable to respond to some 20,000 requests for assistance pertaining to an estimated $3.0 billion in potential flood plain development. These opportunities can not be rescheduled. The growth will take place with or without knowledge of the flood hazard and once in place will generate new growth at the same location. The overall responses that could be provided at $6,600,000 would be constrained to areas where we have data on-hand rather than new areas under new growth where we would have to expend funds for new data. A special study requiring the acquistion of new data to address wide-spread flooding along the Great Lakes due to uncommonly high lake levels would be terminated. The joint hurricane evacuation study program would be brought to a stand-still. Work on the initial phase of hurricane evacuation studies in the states of Connecticut, Rhode Island, and Massachusetts would be canceled. Ongoing work for studies in the states of Virginia, Maryland, Delaware, and New Jersey would be held to a minimum. Completion of the Georgia hurricane evacuation study would be delayed for two years, work on a prototype property protection study in the states of Alabama, Florida, and Mississippi would be canceled, and the full study start for the congressionally directed Southeast Louisiana study would be rescheduled. And finally, at the $6,600,000 funding level, the infrastructure and expertise for a National program of this type begins to erode. We cannot commit the same resources to a $6,600,000 program that we do for a $9 to $10 million program. Over the last five years we have tried to maintain a National presence and capability for the Program in each of our district offices. I'm not sure that we can continue. At the $6,600,000 level of funding, we would probably have to curtail Program responsiveness in large areas. Once we begin to cut back, the willingness of the land use decision makers to seek and use our assistance will drop off and flood plain development without knowledge of the flood hazard will increase.

## INTERNATIONAL WATER STUDIES

Chairman JOHNSTON. Specifically, how does the Corps plan to use the $1,500,000 increase requested for International Water Studies?

General HATCH. The Great Lakes have been at record breaking high water levels for most of the past year. The high lake levels, in and of themselves, have created a significant water problem. In addition, when these record water levels combine with a storm surge and wind generated waves, tremendous losses due to property damage are sustained. As a result of this dangerous situation the Governments of Canada and the United States provided a reference to the International Joint Commission, or IJC, on 1 August 1986. Under this reference the IJC, with support from Federal Agencies, will examine and report upon methods of alleviating the adverse consequences of fluctuating water levels. The Corps is expected to play a key role in this investigation and the $1.5 million increase between FY 1987 and FY 1988 is for this effort.

## GREAT LAKES WATER LEVELS

Chairman JOHNSTON. Please provide for the record, a complete breakdown for all Corps of Engineer Activities related to the Great Lakes Water Levels for FY 1987 and FY 1988 along with a brief description of each activity.

General HATCH. I will provide that for the record. (The information follows:)

### CORPS OF ENGINEER ACTIVITIES
### RELATED TO
### GREAT LAKES WATER LEVELS
### FOR FY 1987

| ACTIVITY | FY 87 FUNDS | DESCRIPTION OF ACTIVITY |
|---|---|---|
| | GENERAL INVESTIGATIONS | |
| Erie County along Lake Erie & Niagara River, NY | $ 50,000 | Perform a limited reconnaissance study to determine if a potentially feasible project exists at or near Hoover Beach, NY. |
| Lake Ontario - St. Lawrence River Shoreline Protection Study, NY | $ 600,000 | Continue the reconnaissance phase of the study to determine the advisability of proceeding into the feasibility phase of the study for flood damage prevention of shoreline properties. |
| Illinois Shoreline of Lake Michigan, IL | $ 415,000 | Continue studies along the Illinois shoreline to determine the feasibility of Federal improvements for flood damage prevention. |
| Diversion of Lake Michigan Water at Chicago, IL | $ 230,000 | Complete a study of the feasibility of diverting water from the Great Lakes down the Illinois and Mississippi Rivers. |
| International Waters Study (GI) | $ 71,000 | Provide technical studies and support to three international boards and |

| | | |
|---|---|---|
| | | one international committee. |
| Flood Plain Management Services (Sec. 206, PL 86-645) | $ 170,000 | Provide flood hazard and related information and advice to improve planning for the prudent use of the flood plains. |
| Coordination with Great Lakes Comm. | $ 15,000 | Provision of info, review of special Task Force documents, and attendance at meetings. |
| Special Investigations (901-171) | $ 82,500 | Response to Congressional and non-Federal inquiries, and request for meetings and speeches on Great Lakes Water Levels. |
| Lake Michigan Shoreline, Edgewater and Rogers Park Communities, Chicago, IL | $2,177,200 | Construction of revetments, offshore breakwaters, a seawall, and beach nourishment to provide permanent protection to public property from flooding caused by high lake levels on Lake Michigan. |
| Presque Isle Peninsula, PA | $1,163,000 | This project provides annual beach nourishment to maintain the beaches at Presque Isle State Park, PA. |
| Emergency Shoreline Protection (Section 14; 1946 Flood Control Act, as amended) | $ 929,000 | Study and construction of small lake shore and stream bank stabilization works to protect public properties in imminent danger. |

OPERATIONS AND MAINTENANCE

| | | |
|---|---|---|
| International Waters Study (O&M) | $ 365,000 | Provide staff support for the operational boards of control and committees. |
| Survey of North Central Lakes (O&M) | $1,459,000 | Perform collection, analysis, and dissemination of hydraulic and hydrologic data on the Great Lakes and provide support to the International Joint Commisssion's Great Lakes boards of control. |

## ADVANCE MEASURES

| | | |
|---|---|---|
| Hampton Township, Bay County, MI | $1,624,000 | Construct clay dikes with riprap, where necessary, along Saginaw Bay to protect large, flood-prone, areas of the township. |
| Akron Township (Fish Point), Tuscola County, MI | $ 367,500 | Construct clay dikes with riprap, where necessary, to ring the Fish Point area and protect it from Saginaw Bay flooding. |
| Village of Quannicassee, MI | $ 84,000 | Construct clay dikes with riprap, where necessary, to ring a portion of the village and protect it from Saginaw Bay flooding. |
| Wightmans Grove, OH | $ 175,000 | Construct a clay dike with riprap, where necessary, to protect the community from Sandusky River flooding which occurs as a backwater affect when there is a storm on Lake Erie and Sandusky Bay. |
| Oregon, OH | $1,071,000 | Construct a stone rubblemound dike on the lakefront and clay dikes elsewhere to protect the community from Lake Erie flooding. |
| Edgewater/Rogers Park Area, Chicago, IL | $1,400,000 | Construct concrete barriers and stone rubblemound dikes in three reaches to protect homes, apartments, and condominiums on the lakefront. |
| Great Lakes Self-Help Program | $6,100,000 | Provide sandbags, sand, plastic sheeting and training so that communities can accomplish short-term protection against lake flooding. To date, all Great Lakes states but Minnesota are participating. This program was initiated in FY 1987 and will continue as long as necessary. |

## CORPS OF ENGINEER ACTIVITIES
## RELATED TO
## GREAT LAKES WATER LEVELS
## FOR FY 1988

| ACTIVITY | FY 88 FUNDS | DESCRIPTION OF ACTIVITY |
|---|---|---|
| | GENERAL INVESTIGATIONS | |
| Illinois Shoreline of Lake Michigan, IL | $ 143,000 | Continue studies along the Illinois shoreline to develop the economic and environmental feasibility of Federal improvements for flood damage prevention and shoreline protection. |
| International Waters Study (GI) | $ 70,000 | Provide technical studies and support to three international boards and one international committee. |
| Flood Plain Management Services (Sec. 206, PL 86-645) | $ 200,000 | Provide flood hazard and related information and advice to improve planning for the prudent use of the flood plains. |
| Coordination with Great Lakes Comm. | $ 15,000 | Provision of info, review of special Task Force documents, and attendance at meetings. |
| Special Investigations (901-171) | $ 82,500 | Response to Congressional and non-Federal inquiries, and request for meetings and speeches on Great Lakes Water Levels. |
| International Waters Study | $1,500,000 | Support to International Joint Commission's Great Lakes Reference Study. |
| | CONSTRUCTION GENERAL | |
| Presque Isle Peninsula, PA | $1,250,000 | This project provides annual beach nourishment to maintain the beaches at Presque Isle State Park, PA. |

| | | |
|---|---|---|
| Reno Beach - Howard Farms, OH | $1,180,000 | Provide permanent flood flood protection to the communities by reconstruction of 15,400 ft. of deteriorated dikes. |

## OPERATIONS AND MAINTENANCE

| | | |
|---|---|---|
| International Waters Study (O&M) | $ 447,000 | Provide staff support for the operational boards of control and committees. |
| Survey of North Central Lakes (O&M) | $1,715,000 | Perform collection, analysis, and dissemination of hydraulic and hydrologic data on the Great Lakes and provide support to the International Joint Commisssion's Great Lakes boards of control. |

## ADVANCE MEASURES

Advance Measures projects may be approved during the balance of FY 1987 and early in FY 1988 but we have no basis for determining the possible locations or estimating the scope of work.

## FIELD DATA COLLECTION PROGRAM (FDCP)

Senator Johnston. How do we justify a more than 100 percent increase in the Beach and Nearshore Data portion of the FDCP over the current level?

General Hatch. Coastal projects for flood control, erosion protection, or navigation are usually designed on the basis of assumed or predicted extreme episodic events such as hurricanes, northeasters, or tsunamis. The increase is to support a program to improve the performance and cost-effectiveness of such designs by measuring the actual effects of such events on existing coastal projects. The data collected by the program will be directly incorporatable into design methodology and will also serve as a basis for improving the predictive capability of design tools such as numerical models. For example, recent experience with the design of a major coastal erosion control and hurricane protection project has shown that millions of dollars of construction costs depended on the ability to predict beach behavior in front of a structure during a hurricane. The technology needed for this data collection effort has been developed and proven under the Coastal Engineering R&D program in anticipation of the actual longer-term data collection taking place under the FDCP.

Senator Johnston. How specifically will the $400k be used?

General Hatch. The funds will be used to establish a program of data collection on the pre- and post- coastal conditions associated with major episodic events. The data collection program will be a combination of seasonal and long-term instrumentation located in areas prine to episodic events and teams of professional and technical specialists to make short-term measurements in conjunction with the anticipated arrival on the coast of a major episodic event. Data collection would be well coordinated with other Federal and state agencies to ensure that all interested parties complement each others' efforts. Typical parameters that would be measured or otherwise obtained by this program would be characteristics of the event itself, surge elevations and waves, beach erosion, structural damage, and other major effects that would be significant influences on project performance and design.

Senator Johnston. What would be the impact if funding were held at the current level?

General Hatch. Level funding will mean that the opportunity to initiate a badly needed episodic event data collection program will be significantly and permanently diminished. The Coastal Engineering R&D program efforts described in the answer to the first question were terminated this Fiscal Year due to a reduction in available funds. Postponing the technology transfer from that work to the FDCP for one more year will have a substantial negative effect in terms of technology and expertise continuity. In short, it would place the FDCP effort much closer to starting from scratch, wasting the years of development and progress made under the R&D program. Economic impact on the Corps' coastal design programs would be significant in light of the large number of projects authorized by PL 99-662 -- 21 coastal shoreline protection projects with a total construction cost of $610 million. Virtually all of these projects would benefit from the data and improved design guidance that would result from the proposed work.

## DAM SAFETY ASSURANCE PROGRAM

Senator Johnston. The Dam Safety Assurance Program has grown from a level of $4,000,000 in 1986 to a requested level of $32,000,000 for FY 1988. As was the case last year, the Congress is again being asked to appropriate a large sum ($25,000,000) for unspecified work that "May be approved." First, how do you see the funding request for Dam Safety Assurance changing over the next 5 years?

Mr Duscha. Mr. Chairman, as dam safety needs can arise from a number of factors, it is difficult to predict a funding request for a 5-year period. However, based on what we see on the horizon today, it is expected that the average request will approximate $25-30,000,000 annually for the next several years.

Senator Johnston. Why should the Congress provide $25,000,000 with no idea of how the funds will be applied? Is it unreasonable to expect specific data on the use of the $25,000,000 prior to making the appropriation?

Mr. Duscha. Sir, approximately 33 dams are being analyzed for potential safety problems, and we expect about 9 dams to reach a decision point prior to and in FY 1988. As the budget is established well in advance of need and dam safety needs are not always definable in advance, it is difficult to be specific on the use of the $25,000,000. However, knowing the potential needs that will require correction, we are confident that the $25,000,000 will be judiciously applied to dam safety needs.

Senator Johnston. Can you provide for the record a table showing how the $25,000,000 will be used?

Mr. Duscha. We will provide such table indicating those dams on which we anticipate expending the $25,000,000, subject to approval of the proposed work by the Assistant Secretary of the Army (Civil Works). Of course, more critical needs could be surfaced in the interim.

SCHEDULE FOR FUNDING DAM SAFETY

| Project | Estimated Total Cost ($1000) |
|---|---|
| Baldhill Dam, ND | 30,600 |
| Beach City Dam, OH | 8,000 |
| Bolivar Dam, OH | 6,150 |
| Homme Dam, ND | 1,000 |
| Isabella Dam, CA | 30,000 |
| Lake Traverse Dam, SD and MN | 1,100 |
| Prado Dam, CA | 6,100 |
| Tenkiller Dam, OK | 32,000 |
| Waco Dam, TX | 21,500 |

Senator Johnston. What happens to the unused funds if new starts of $25 million are not approved?

Mr. Duscha. Mr. Chairman, if per chance sufficient starts were not approved to use the allotted amount, the available funds would be carried over to the ensuing year for use on dam safety or reprogrammed to meet other urgent requirements in the Construction, General account of needed.

## CIVIL WORKS RESEARCH AND DEVELOPMENT

Senator Johnston. What management changes has the Corps made over the past year to provide more critical evaluation and review of on-going and proposed R&D activities?

General Hatch. The Corps has for many years managed the Civil Works R&D program intensively. Every R&D program and each work unit within each program is monitored on a continuing basis by Technical Monitors, who are part of the Civil Works staff, not the R&D staff. This assures independent critical oversight at the detail level. It also assures that each work unit is practical and is aimed at a high priority, high pay-off problem or opportunity for saving in the Civil Works mission area. Further, we have oversight of the entire program by a Civil Works R&D Review Committee which is composed of Civil Works Division Chiefs and under the personal oversight of the Deputy Director and Director of Civil Works which makes the final decisions on the annual R&D budget and work plan. This assures I believe that every federal dollar spent on Civil Works R&D is aimed at a high priority problem, has a sound research approach, has a practical field useable end product that provides an excellent return on investment. This system of R&D program development and review I believe, has provided critical and effective evaluation and review. There has been one change to the internal working procedures of the Civil Works R&D Review Committee during the past year which has itensified the "hands-on" review of the entire program by the Committee and has strengthened the process. In the past the Committee tended to review more broadly, provide policy, and give final approval to the annual program. This increased evaluation at the detail level has, I feel, given top management an even better feel for the R&D program and made more direct their input into the process.

Senator Johnston. What new R&D facilities or equipment are requested in the 1988 budget? What will be the budgetary impact of these new items in future budgets?

General Hatch. There are no new major items requested in the 1988 budget for R&D facilities or equipment. However, two ongoing items from previous fiscal years will continue to be funded in FY 1988. These are the Information Technology Laboratory ($3,000,000 in FY 88) and Additions and Betterments (A&B) to the Coastal Engineering Research Facility ($950,000 in FY 88).

Senator Johnston. What new non-R&D facilities are being requested at the Corps four Research Centers in the 1988 budget and what is the future budgetary impacts of those facilities?

General Hatch. There are no new non-R&D facilities in the Corps FY 88 budget request.

Senator Johnston. How will these facilities be funded? If funded through the Plant Replacement and Improvement Program, what activity is charged to recover the associated costs?

General Hatch. The Waterways Experiment Station (WES) major facilities are funded through the Revolving Fund Plant Replacement and Improvement Program (PRIP). Reimbursement to the Revolving Fund includes the amounts charged for depreciation, plant increment to provide for replacement, and insurance costs. Most structures are amortized over a 50 year period. The reimbursement costs are derived from direct allocations from the Civil Works program as well as from reimburseable work in progress at the Waterways Experiment Station.

Senator Johnston. Provide for the record a detailed breakout of the R&D items funded through the PRIP over the past 5 years along with a brief description and justification of the item and the associated recovery charged to the R&D account each year through complete payment.

General Hatch. The major items funded through PRIP over the past five years which are all located at the Waterways Experiment Station are shown in Table I. The annual recovery charges collected to date are noted on Table II as well as the final scheduled repayment date. The high rate of recovery on the Movable Bed Spectral Wave Generator is due to a projected 13 year life as it was classified as laboratory equipment.

Table I: Funding for Major Items FY 83-87 (x$1,000)

| Item | FY 83 | FY 84 | FY 85 | FY 86 | FY 87 |
|---|---|---|---|---|---|
| Electrical Substation | 603 | | | | |
| Movable Bed Spectral Wave Generator | 373 | 289 | | | |
| A&B Hydraulics Bldg. | 20 | 121 | 31 | 610 | 2473 |
| ITL Facility | | 24 | 80 | 346 | 1651 |
| A&B Coastal Research Building | | | | | 50 |
| Rip Rap Test Facility | | | 275 | 750 | 633 |

Table II: Reimbursement of PRIP FY 83-87 (x$1,000)

| Item | Estimated Final Recovery Date | FY 84 | FY 85 | FY 86 | FY 87 |
|---|---|---|---|---|---|
| Electrical Substation | 2034 | 30 | 30 | 31 | 13 |
| Movable Bed Spectral Wave Generator | 1997 | | 43 | 162 | 64 |
| A&B Hydraulics Building | 2038 | | UNDER CONSTRUCTION | | |
| ITC Facility | 2039 | | UNDER CONSTRUCTION | | |
| A&B Coastal Research Bldg. | 2038 | | UNDER CONSTRUCTION | | |
| Rip Rap Test Facility | 2038 | | UNDER CONSTRUCTION | | |

A brief description and justification for each of the above Major PRIP Items follows:

### Electrical Substation.

An electrical substation was constructed to meet the power supply demands of the Waterways Experiment Station (WES) that could not effectively be met by the local utility for now and the future; and to provide WES with a cost savings on its electric bill from .085 cents/KWH to our present rate of .047 cents/KWH.

### Movable Bed Spectral Wave Generator.

This wave generator was necessary to simulate the effects of directional wave spectra on coastal structures and studies of shoreline stabilization. Reproduction of the directional spread of prototype storm wave energy is essential for analysis of the impact of storm waves on coastal shoreline processes and structures. Studies conducted to date demonstrated the significant influence of directional wave conditions and variation in directional wave spreading.

### Additions & Betterments-Hydraulics Laboratory Headquarters.

The 21,000 sq ft expansion and improvement to the Hydraulics Laboratory Headquarters Building will allow staff presently housed in 20 remote portable buildings and requiring access to the computer terminal in the Headquarters Building to be consolidated. In addition, energy consumption will be cut in half for a total annual reduction in energy consumption of 882,000 BTU's.

Information Technology Laboratory

The current WES automatic data processing center and associated office space of approximately 16,000 sq ft is totally inadequate to support the WES and LMVD automation requirement. The new facility (approximately 50,000 sq ft) will satisfy this requirement and provide critical support accommodations for WES, LMVD, and OCE during emergency operations including mobilization.

Additions & Betterments-Coastal Research Building.

Additional office and conference room space is required to consolidate the Coastal Engineering Research Center (CERC). Currently CERC employees are distributed among 14 distant and cramped permanent and portable buildings. Staff consolidation in this annex will provide access to needed work areas, eliminate inefficiencies in work organization, and effect maximum energy savings.

Rip Rap Test Facility

This one-of-a-kind facility will allow large scale tests of riprap for streams and rivers to develop design criteria to reduce size and amount required for bank and bottom protection. Associated savings from these tests are expected to be in the millions of dollars for the Corps as well as other users.

Senator Johnston. Now, the 1988 budget includes specific request of $21.5 million for general R&D activities and another $3.0 million under O&M for a new Dredging Research Program. Of the $3.2 billion total budget request, how much is R&D related?

General Hatch. Of the $3.2 billion total budget request, $35,025,000 is for Civil Works R&D. As noted $21.5 million is for general R&D activities and is in the General Investigations account. In the Operations and Maintenance account $9,985,000 is for R&D which includes $6,835,000 for the Repair, Evaluation, Maintenance, and Rehabilitation research program; $1,150,000 is for the River Ice Management research program; and $3,000,000 is for the new Dredging Research Program. In the Construction General account there is $2,300,000, for the Aquatic Plant Control Research Program. Finally, in the General Expense account there is $240,000 for expenses attendant to the operation of the Coastal Engineering Research Board, a congressionally established board to provide the Corps with advice on coastal engineering research.

Senator Johnston. Why isn't the $3.0 million Dredging Research Program included under the normal R&D account? Would there be any adverse impact if this new activity were combined under the R&D item? If so, please explain.

General Hatch. The new Dredging R&D program is budgeted in the Operations and Maintenance (O&M) portion of the Civil Works budget because it supports the O&M dredging activities of the Corps. The program was requested by the O&M community in the Corps. This is in accordance with the practice of funding those programs which are strongly in support of O&M activities in that portion of the Civil Works budget which provides for those activities. This provides closer oversight of the R&D not only technically but during the annual budget process. It should be noted that several other R&D programs that were closely associated with the O&M process were funded out of the O&M account and included the Repair, Evaluation, Maintenance and Rehabilitation (REMR), River Ice Management (RIM), and Environmental and Water Quality Operational Studies (EWQOS) R&D programs. Each of these programs has been a relatively short life span (6 years), intensive effort, high funding level R&D program that has been specially managed by both Civil Works headquarters and field personnel associated with O&M activities. It should also be noted that Civil Works R&D is funded from four Civil Works accounts including General Investigations, Construction General, General Expenses, and Operations and Maintenance. Fundamental R&D that broadly supports all Civil Works functions and that is continuing in nature has been traditionally funded in the General Investigations account. To budget a short life span, high annual funding level ($6 to 8 million per year) R&D program in the General Investigations account would be disruptive and prove difficult to manage, especially considering the recent budget reductions that have occurred in the General Investigations R&D account.

Senator Johnston. Provide for the record a detailed breakout by object classification of the total R&D related funding included in the FY 1988 budget.

General Hatch. A detailed breakout by object classification of the total Civil Works R&D funding of $35,025,000 is as follows:

| Object Code | Object Classification | Amount ($000) |
|---|---|---|
| 111 | Full-time Permanent | 9867 |
| 113 | Other than Full-time Permanent | 2042 |
| 115 | Other Personnel Compensation | 2002 |
| 117 | Military Personnel | 44 |
| 121 | Personnel Benefits, Civilian | 1455 |
| 122 | Personnel Benefits, Military | 23 |
| 123 | Military Accrued Retirement | 26 |
| 210 | Travel and Transportation | 1636 |
| 220 | Transportation of Things | 93 |
| 231 | Rental Payments to GSA | NA |
| 233 | Communications, Utilities | 1883 |
| 240 | Printing and Reproduction | 1865 |
| 250 | Other Services | 10860 |
| 260 | Supplies and Materials | 1508 |
| 310 | Equipment | 1721 |
|  | Total | 35025 |

Senator Johnston. Also provide for the record a detailed breakout of the work conducted at the Corps' four research centers - as a minimum the data should show the level of work done for others highlighting major commitments; work done in support of the Military Construction Program; and other DOD work.

General Hatch. A detailed breakout of the work conducted at the Corps four research centers is as follows:

| Civil Works R&D (Estimate) | ($000) FY 88 |
|---|---|
| Civil Works Direct Funded R&D | $35,205 |
| Civil Works Reimbursable (Project Related) | 39,000 |
| Military R&D (Estimate) | ($000) |
| Military R&D in Support of Mil Const. | $12,000 |
| Military R&D (other Direct Funded) | 35,800 |
| Military R&D Reimbursable (Army, Air Force, other DOD) | 120,000 |

## SUBCOMMITTEE RECESS

Senator Johnston. Thank you very much, General Hatch, and thank you to your staff. We have a very high opinion of the headquarters staff of the Corps of Engineers, they give civil servants a good name and reputation. We appreciate the good work that they do and that you do.

The committee will stand in recess until March 12.

[Whereupon, at 11:08 a.m. Thursday, March 5, the subcommittee was recessed to reconvene at 10 a.m. March 12.]

# ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 1988

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THURSDAY, MARCH 12, 1987

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
*Washington, DC.*

The subcommittee met at 10:20 a.m. in room SD–192, Dirksen Senate Office Building, Hon. Jim Sasser presiding.

Present: Senators Stennis, Sasser, Hatfield, and Cochran.

## TENNESSEE VALLEY AUTHORITY

### STATEMENT OF CHARLES H. DEAN, JR., CHAIRMAN

ACCOMPANIED BY:
JOHN B. WATERS, DIRECTOR
WILLIAM F. WILLIS, GENERAL MANAGER
EDWARD CHRISTENBURY, GENERAL COUNSEL
BEVAN BROWN, DIRECTOR, AIR AND WATER RESOURCES DIVISION, OFFICE OF NATURAL RESOURCES AND ECONOMIC DEVELOPMENT

### OPENING REMARKS

Senator SASSER. The subcommittee will please come to order. This morning, we continue our hearings on the fiscal year 1988 budget request. We will hear from the Tennessee Valley Authority and will follow with the Appalachian Regional Commission.

We are pleased to have with us this morning Mr. Charles H. Dean, Jr., Chairman of the Tennessee Valley Authority, and Director John Waters. I also want to welcome Bill Willis, the TVA General Manager here this morning to present testimony of the fiscal year 1988 budget. We welcome all of you to this committee today.

### CREDIBILITY OF TVA'S NATURAL RESOURCE DEVELOPMENT PROGRAMS

I want to make just a few remarks before we get into your testimony. We are here to discuss, as I said earlier, TVA's fiscal year 1988 appropriation for its natural resources and agricultural development programs, programs that I have consistently supported in the past and programs that this committee has consistently supported and programs that we feel deserve strong support.

But, Mr. Chairman and gentlemen, I want to be very candid with you. The credibility of TVA's natural resource management programs and the potential for success of those programs has been eroded to some extent by the suspicion and anxiety that surrounds TVA's nuclear program.

The Tennessee Valley Authority has always maintained that its mission in the Tennessee Valley area is one mission: The unified management of the region's natural resources in order to promote economic development. That was its reason for being, and I certainly subscribe to that view, and I strongly support the philosophy behind it.

If one element of TVA's efforts is working, then it contributes to the success of all of TVA's programs and certainly to the perception of success.

### NUCLEAR POWER PROBLEMS

But unhappily, the reverse can be equally true. Right now, TVA 's good work in agriculture, its good work in natural resource management is hidden and hidden beneath a dark shadow of idle and half-completed nuclear plants. Certainly, I am not telling this chairman and this director and this general manager anything they don't already know.

I think it is important to begin with a clear picture of where we stand. Now, I have been greatly encouraged by the good news that has come out of the nuclear program in the last week. The Sequoyah start-up schedule is an indication that Admiral White has made progress in the few months since he has been back at TVA. I applaud his efforts and I know that this board is doing everything possible to get TVA's nuclear program generating power once again.

### RESOURCE MANAGEMENTS NEEDS

I also believe that there is more TVA can do to regain the initiative and to regain public confidence. I believe that TVA continues to have solid expertise and I continue to believe that TVA's basic mandate does have great relevance to the needs of the citizens of the Tennessee Valley region. But I am concerned that TVA's resource management agenda is not precisely adjusted to the resource management needs of the region as I perceive it.

Now, I am certainly not talking about a reduced TVA role. Let me say at the outset that the administration's proposal of $72 million for the TVA's appropriated budget is inadequate. I believe that the resource management problems of the TVA region are grave enough to warrant increased TVA activity, especially with regard to the land and to the water of the region.

I intend to work very hard to see that TVA's budget is at least as large in fiscal 1988 as it was in fiscal 1987. But having said that, it seems to me that the portioning out of those funds has been too lavish in some areas and, perhaps, too austere in others.

In my travels, for example, throughout Tennessee, I get continuing indications that already severe resource problems are getting worse and that TVA is not doing enough to address them. At the same time, I hear complaints that some TVA programs, though well-intentioned, are not producing the tangible, positive results that we wish.

I want to get your views on the specifics of TVA's economic development programs a bit later, Mr. Chairman, and perhaps those of Director Water and General Manager Willis. But let me give you an example of what I mean by perhaps being too lavish in our expenditures in some areas and too austere in others.

### WATER QUALITY PROBLEMS ALONG TENNESSEE RIVER

Virtually everyone in Tennessee acknowledges that water pollution problems on the Tennessee River and its tributaries are getting worse, and I must say to you, frankly, I have seen the problem first-hand; I have seen it on Kentucky Lake in west Tennessee. I have seen it at the Boone Resevoir in east Tennessee. We all know of the long-standing soil erosion problem that is polluting the waterways in west Tennessee's agricultural counties and washes our very valuable topsoil down the Mississippi and to the Mississippi delta, where I suppose Senator Stennis and Senator Cochran are welcoming it, and we know that Champion Paper Co. in North Carolina is polluting the Pigeon River in east Tennessee. Finally, we know that all these trouble spots have gotten steadily worse during the monumental drought that we have had over the past 3 years.

TVA has not been blind to this situation. Let me read to you, if I may, a document that your own environmental quality staff put together just last year. Reading from this document, after acknowledging that TVA's dams are having a negative impact on 340 miles of stream in the valley, this TVA report quotes the state of Tennessee on some of the specific water quality problems encountered in east Tennessee, and I want to quote this TVA report.

It says, quoting:

> During some periods of the year, turbine releases from the Cherokee Resevoir have the impact on downstream dissolved oxygen levels equivalent to the untreated wasteload of 860,000 to 3,500,000 persons, depending on the flow.

Continuing to quote from the report:

> The underflows from Cherokee, Douglas, and Fort Loudoun have passed to Watts Bar, along with any unassimilated waste from Knoxville, and as such, the water quality of the upper reaches of Watts Bar is seriously degrading.

That is shocking, and I expect shocking far more to hear that the turbine releases from Cherokee Reservoir are equivalent to the untreated wasteload of between 860,000 to 3,500,000 individuals, depending on the flow.

It appears clear from the staff analysis that has been made by TVA that these unaddressed water quality problems—and I am talking about all water quality problems—is not just dissolved oxygen. It appears clear that failing to deal with those problems will hurt the economy in the Tennessee Valley more than some economic development programs are presently helping.

NEED FOR TVA TO CHANGE PROGRAM PRIORITIES

I know that TVA has no regulatory authority. I know that the drought conditions of the last 3 years have been the chief culprit in stressing Tennessee's water resources to the maximum. But I think that both of these factors are very strong reasons for TVA to adjust its priorities in a way that puts greater emphasis on managing water quality.

Let me give you an example of what I am talking about. Doesn't it make more sense for TVA to spend money, more money, to help clean up Boone Lake than to produce a glossy brochure for an industrial park? And doesn't it make more sense to put TVA's energy and expertise into saving an invaluable resource like the beautiful Kentucky Lake rather than doing a statistical analysis of industries that just might or might not locate in a given area?

At a time, and, I think, all across the valley, of increasing disparity between metropolitan prosperity and what we see as rural poverty, at a time when general revenue-sharing funds have dried up altogether and there doesn't seem to be much hope of reinstating them in the future, doesn't it make sense for TVA to do everything it can to help rural county governments design and build wastewater treatment facilities? Shouldn't TVA, with its vast expertise, be taking the lead in solving some of the nonpoint source water quality problems, national problems like agricultural runoff.

In short, recognizing that water quality is such a critical element in any economic development strategy, the question I am asking today is: Is TVA concentrating enough of its energies and enough of its appropriated budget in stopping and preventing water pollution?

Chairman Dean, I know that your written testimony probably doesn't address this question directly. I suspect you will want to give us your views on it after your prepared remarks.

But let me say right now that TVA was created as a unique river basin management agency. Its greatest successes have been the managing, using and protecting the water resources of the Tennessee Valley. Today, it has been estimated that there are 38 reservoirs in the Tennessee Valley that suffer from poor water quality.

There are numerous streams, some of them the most scenic streams in the country, that are endangered by both pollution and decay. So as we work together in an effort to help TVA regain some of the luster of its glory years, perhaps these are some of the problems that we should tackle and that TVA should solve.

Gentlemen, let me now defer to my colleague, first Senator Stennis, for any opening remarks that he might wish to make, and then to our distinguished colleague, the junior Senator from Mississippi, Senator Cochran.

Senator Stennis?

## UNIFIED PROGRAM FOR RESOURCE AND ECONOMIC DEVELOPMENT

Chairman STENNIS. Mr. Chairman, I thank you very much. In fact, I am interested in the entire TVA enterprise and undertaking. I am here today to learn where we should place some money, enough to have a real meaning and impact to match the need, and to see what else can be done in the way of general support of TVA.

I have been noticing TVA's contributions for a good number of years, and in the area of agricultural and economic development, I think TVA is the outstanding example for the nation. The overall contribution and effectiveness does not deserve to be discredited because there may be a minor, temporary defect here or there, and even a major defect here and there.

You mentioned the problem of energy, and you mentioned it with understanding and sympathy—the nuclear energy program, I mean. There is trouble in TVA, maybe, in reference to that. But nuclear power everywhere is generally in about the same situation, not necessarily reflecting on TVA at all.

We are going to have, as I understand, a vote that will be coming up shortly. I want permission to file an additional statement for the record and some questions for the record for answering.

Senator SASSER. That will be done.

## PREPARED STATEMENT

Chairman STENNIS. We will save time here so that we hear not only from TVA, but also the Appalachian Regional Commission. So for the time being, I ask permission to pass on the conditions I have outlined, but reiterating my confidence and my experience here that has given me that confidence, the capacity of this agency of the government.

It is needed, and it must not be neglected. Thank you very much.

[The statement follows:]

### STATEMENT OF SENATOR STENNIS

Mr. Chairman, the Tennessee Valley Authority has done outstanding work over the years, not only with its role as the supplier of electric power for the Tennessee Valley area, but also as the shining example in the nation of a unified program of resource development for the advancement of economic growth. The programs for which Congress appropriates funds, including the natural resources programs, the Agricultural Institute, national fertilizer development, and economic and community development, have been highly successful even though the TVA appropriated budget has been reduced 55 percent, with further erosion from inflation, since 1980. I personally have been well acquainted with TVA's activities and have observed them with great appreciation. They have never come under criticism by anyone who is familiar with their work.

The administration now proposes an additional 27-percent reduction and total elimination of the economic development program. It would be tragic, indeed, to severely reduce or eliminate these programs which have had such a positive impact on rural areas.

In the last year alone, TVA participated in over 50 economic development projects in my state of Mississippi ranging from assistance with the expansion of a woodworking plant to water system improvements for an industrial park making possible more than 100 new jobs. This development would not have been possible without TVA.

It is essential that we continue supporting these important programs which provide aid to the rural areas. We cannot abandon these matters. The consequences of losing them is far beyond what many realize now. We must be sure that they have enough funding to have a real meaning and that their funding will match their needs.

Again, I commend the Tennessee Valley Authority for the fine job it is doing, and will do in the future, to bring economic improvements to the TVA area.

## IMPACT OF TVA PROGRAMS IN MISSISSIPPI

Senator SASSER. Thank you very much, Senator Stennis.

Senator Cochran.

Senator COCHRAN. Thank you, Mr. Chairman. Mr. Chairman, I am glad to be able to be here today to welcome our witnesses on the first panel to the subcommittee.

Chairman Dean, Mr. Waters, Mr. Willis, we are glad you are here.

I want to additionally thank you for your willingness to serve in these tough jobs. I have followed with a great deal of interest the discussions about TVA in the press and here in the Capitol for the last several years, and I don't remember a time during which I have been here where there seems to be more attention being focused on TVA, critical attention. I don't know that all of it is that well deserved, frankly, but these are tough times. These are difficult economic times for the region.

Our state has had serious unemployment problems and continues to have much difficulty in agriculture in rural America and in the oil and gas industry.

So at a time, I think, like that, people try to find somebody to blame for everything. I notice that TVA gets blamed for a lot of things, too, that it may not have any responsibility for. But I hope you won't be discouraged by some of the unfair criticism that has been leveled at TVA—some may be deserved—and continue to work hard to try to help ensure that the mission of the Authority is carried out and that power is provided throughout the region of responsibility, as it has been for these last 40 or 50 years.

We appreciate TVA's contribution to economic development in north Mississippi. Right now, we can point to some projects that are underway that are helping to ensure the utilization of the Tenn-Tom Waterway and the creation of jobs and businesses and industries along that waterway.

That is important for our state. It is important for that to be continued. I, again, am glad to be here to hear your testimony and assure you that there are some of us in the Congress who want to try to work in a constructive way to help identify ways to assist in the allocation of needed resources. That is why I am here today.

I am glad you are here and I commend you, again, for your hard work.

Senator SASSER. Thank you, Senator Cochran.

Chairman Dean will be our first witness, and for the record, Mr. Chairman, would you introduce your associates and then proceed with your presentation?

## INTRODUCTION OF SUPPORTING WITNESSES

Mr. DEAN. Thank you, Mr. Chairman. On my far left is Mr. Ed Christenbury. He is the new general counsel in the Tennessee Valley Authority.

Senator SASSER. We welcome you here, Mr. Christenbury. I believe this is your maiden voyage up here before the committee. We are delighted to see you.

Mr. DEAN. He comes to us from the NRC, so he is familiar with the Washington scene, and he has spent more time here than he expected to after he moved to Tennessee. On my left, of course is Director Waters and on our right, Bill Willis, our general manager.

We appreciate the chance to be here and talk to this committee about our 1988 budget. You and other members of this committee have been loyal supporters of TVA, and we thank you for that. We know you face difficulty in weighing the competing demands for scarce dollars, and we appreciate the confidence you have placed in us in prior years.

It is especially good to see you here today, Senator Stennis. As everybody knows, we haven't a better friend than Mr. Stennis, and we look forward to working with him in the years to come.

Of course, Senator Cochran, we are glad that you are here to complete the representation from the state of Mississippi. We have always found that folks from Mississippi have been particularly friendly toward TVA for a variety of reasons. We are glad to have such friends.

We will file for the record, Mr. Chairman, our formal testimony, and I would like to very briefly summarize that statement.

## FISCAL YEAR 1988 BUDGET REQUEST

We are here to outline the President's budget request for TVA of $72,773,000 for fiscal 1988. The administration requests $32,627,000 for natural resources programs broken down as follows: Reservoir or system operations, $21.2 million; $2.5 million for water resources; and $550,000 for land and forest resources in order to allow TVA to continue managing the water levels in wetlands adjacent to mainstream reservoirs.

Resource management and development support funding will total about $2.5 million. Land Between The Lakes is funded at $5.9 million. The administration requests $3.6 million for the Agricultural Institute and $25 million for the national fertilizer development program. This includes $13 million for fertilizer research and development; $9 million for technology introduction; and $3 million for hardwood research and testing.

That would include our alcohol-from-wood program which we are making considerable progress on.

The request for capital investment funds totals $10.7 million, including $2.6 million for dam safety modifications. Obviously, we intend to upgrade our dams wherever appropriate to meet design criteria for new dams.

Four million dollars is for the fertilizer test facilities. Our request for general facilities, scattered throughout the program, is $1.6 million.

### POWER PROGRAM

We would like to talk just a minute about our power program, which, of course, is not financed with appropriations. Senator Sasser referred to the problems we have had in our nuclear program in saying that they had somewhat tarnished the image of TVA. John Waters and I are quite aware of these nuclear problems and the serious significance of them.

Mr. Waters and I have never had the chance to order a nuclear plant, but we have sure had a chance to try to fix some of them up and run them right, and that is what we are intending to do. We brought back Steve White, who has had a lot of experience in the nuclear Navy as a high-level manager, to manage and lead our recovery effort.

Now, I might point out that the rest of our power program is running really well. We are very thankful for the fact that we had outstanding availability and efficiency from our fossil plants. We have met all our power demands with no problem whatsoever. Our hydro plants are some of the best in the world. All we need is for it to rain. Lately, we have been getting a little of that, but we did have a bad drought last year.

Our conservation, energy and management, R&D and environmental protection activities are outstanding and are examples for the rest of the country.

Significant milestones have been reached in our cooperative programs to test and demonstrate advanced technologies that can and will help meet the electric power industry needs in the future. The design of the atmospheric fluidized bed combustion demonstration unit, which is being built in Paducah is complete, and construction is well underway. Steel is in the air and the plant is taking shape. This process, the fluidized bed process, promises a cleaner and more efficient way to use our plentiful high-sulfur coal supply, and it will be among the technologies used in the fossil electric plants of the future, and TVA is right in the forefront of that project.

Again, about our nuclear power program, TVA, of course, is proud to have Steve White back, but he had to leave for 3 months due to some concerns we had last year. Our concerns have since been resolved. We are making progress in returning TVA's nuclear plants to safe and efficient operation. We expect and support Mr. White and we are confident that he can restore the plants and do it successfully.

One of his mandates is to develop an effective training program for career TVA managers. He has made training and recruiting of career TVA managers a top priority in the recovery program. The board is very interested in this, and we believe that Mr. White has demonstrated by his actions that he is making every effort to identify qualified managers within the agency and promote them to the senior management positions.

He is also recruiting experienced managers where he can from outside the agency and using contract managers only when it is absolutely necessary to meet specific needs. We are in daily contact with Mr. White to help us stay abreast of this nuclear program which, as you pointed out, Senator Sasser, is very serious and very prominent in our thoughts.

## WATER QUALITY

You mentioned some things about water quality. We have a lot of water quality experts here with us today. You mentioned turbine releases and the high level of demand for dissolved oxygen. We certainly are aware of the fact that when water settles in the bottom of the lake and is, therefore, moved through the turbine, the water is low in dissolved oxygen.

We would only point out—and we will elaborate on it, as we have a chance—but we would only point out that this water situation is complex and the things that go into our lakes vary. For instance, somebody gave me some information the other day.

The urban runoff in the area of Knoxville—that is my home town—contributes more pollution to Fort Loudoun Lake than all the sewage treatment plants discharging into that reservoir, just urban runoff, caused by failing tanks, runoff from construction sites, overflowing sewage collections and then the things that get washed off of parking lots, lead from leaded gasoline; dirt, oil and all kinds of pollution. In other words, what we are faced with is a very complex thing.

We have periods like last year when we had very low rainfall and it increased the dissolved oxygen problem. I want to assure you that we will answer, of course, your detailed questions, but I want to assure you that we are very concerned also about this pollution and low oxygen in the lakes. We deeply appreciate that problem, and I am certain we won't ignore that.

Mr. Waters, you might want to add a few things.

Mr. WATERS. Thank you very much, Mr. Chairman.

Senator SASSER. Could you pull that microphone a little closer, Mr. Director?

## STATEMENT OF DIRECTOR JOHN WATERS

Mr. WATERS. I appreciate that. I appreciate the opportunity to appear before you, Mr. Chairman, and our distinguished two U.S. Senators from Mississippi. It is a real pleasure for me to have the opportunity to testify before my senior U.S. Senator. I welcome that opportunity.

I hope you will pardon the personal reference. I have a lot of friends in back of me here from the Appalachian Regional Commission. It is not my job to tell their story. They will do much better, but look on them with favor, Mr. Chairman, if you would. [Laughter.]

They are good people. I learned a lot at the Appalachian Regional Commission, and I think I have continued to learn at TVA. I think that I have learned when good, hard-working and creative people are willing to work together and with a government that is cooperative, that we can do those things that all of us want to do so badly to increase our quality of life and certainly, the quality of life of those generations yet unborn that we are responsible for in the Tennessee Valley.

We know in TVA that their well-being and their future, depends on how well we carry out our responsibility to protect our land and our water and our air and we help develop our rural areas that have such great potential for being a good place to live and raise families. We must also manage our waste that we seem to be generating.

We know that if we are going to continue that stewardship that we have to stand before this group and others and prove that we can be efficient; that we can recognize the needs that you have alluded to, Senator. And we must be better focused. We must eliminate those things that we don't do well or that somebody else does better, and focus our job where we have the expertise, where we can do it better than anybody else and cheaper than anybody else.

If we can prove those areas, we would like to continue to have your support, and where we can't, we don't deserve it. There is much left to be done. As, Mr. Chairman, I think your remarks told us, there is much left to be learned.

I thought TVA had learned most of what you need to know about water quality, but the person who has been at TVA longer than anybody else in this effort and is here today, our manager of water quality, Bevan Brown, told me just last night how much we learned just in the last 2 years about water quality and managing when we had low levels in our mainstreams, caused, of course, by the drought.

We simply didn't know before the impact of that. We know that it takes a certain volume to assimilate the problems and the waste that flows into the river. We didn't realize how serious it is. So we are continuing to learn; we are continuing to work. We recognize every point, I think, that you made, Senator Sasser, and I share so very many of those concerns.

We must do a better job. There is much left to be done. We are happy to be here and respond to your questions and respond to those questions, Senator Stennis, that you and the others may want to submit in writing.

Thank you very much.

Senator SASSER. Thank you, Director Waters.

Mr. Chairman, will there be any further testimony or are we ready for questions?

Mr. DEAN. We are ready for questions, sir.

### WATER QUALITY PROGRAM

Senator SASSER. Mr. Chairman, how much is the Tennessee Valley Authority presently spending on water quality improvement, not just water quality improvement, but how much on water pollution control right now?

Do you have those figures at your disposal?

Mr. DEAN. Yes, sir; our water quality people break it down slightly different from the budget justification, but the figure comes to about

$6.2 million of our funding in 1987 is involved in strictly water quality. That is broken out from the reservoir system operation, but just for water quality enterprises.

Senator SASSER. Can you give us a reasonable estimate on how much you could efficiently spend on water quality to control water pollution?

Mr. DEAN. We can spend about $2 million a year, on average, for the next 4 years to do further important research and demonstrations in water quality work.

Senator SASSER. In other words, $2 million in addition to the $6.2 million that you are spending now?

Mr. DEAN. Yes, sir; yes, sir.

Senator SASSER. So you could efficiently spend at least $8.2 million on water pollution and water quality control programs?

Mr. DEAN. Yes, sir.

## DISSOLVED OXYGEN

Senator SASSER. What is TVA presently doing now to improve the dissolved oxygen content of the streams below the TVA dams?

Mr. DEAN. We have some innovative programs. Some of the best ones involve turbine devices which actually add oxygen to the lakes. We have those installed at Norris and other dams, and they have been pretty successful. We use them in times when the lakes have been stratified, when they have been sitting fairly inactive for a long time, and we find that they do add oxygen to the point where my friends who have time to fish tell me that the fishing is consistently good below Norris Dam, which is one of our upper mainstream dams.

The turbine venting is one solution. We have experimented some with actually bubbling air down into the water to increase the oxygen availability, but that is a fairly expensive process. We are not ignoring this problem, and those are some of the things that we have been experimenting with.

The problem is that sometimes these devices have a detrimental effect on how much energy you can get out of the water, so you have got tradeoffs to consider, too.

Senator SASSER. Speaking of fishing, Mr. Chairman, you might be interested in some observations that I made down at Kentucky Lake this summer. We were getting repeated complaints from fishermen, both commercial and sport fishermen who fish on Kentucky Lake, and also those who gather mussels there, and I actually saw with my own eyes catfish that, when they were opened up, were rotting from within, and almost a gangrenous type substance inside their bodies, and the fish were living.

But the mussels inside the fish were rotting and decomposing. We also saw and heard testimony of fish that are caught on a line that are so highly stressed that by the time they are pulled into the boat, they are dead. They simply don't have the energy because of being so highly stressed to try to live in the water with very low oxygen levels that the simple swallowing of a hook and pulling them into the boat actually kills the fish.

What are the problem reservoirs in the TVA system at the present time?

Mr. DEAN. Well, starting from the top, we have had some particular problems up at Boone Reservoir, which you quite correctly mentioned in your talk. In the case of Boone, there was an overload of domestic waste which was not properly treated. There are some serious efforts underway to correct that problem, but that is one that comes to mind.

Then as you move on down, Cherokee and Douglas, in the summer, especially in years of low flow, the water tends to stratify, and releases have reduced concentrations of dissolved oxygen. You also mentioned the Canton, N.C., paper mill. Actually, the water that comes from that paper mill, as far as I know, color and dissolved solids are the primary pollutants affecting Tennessee that come from there. Nobody likes to look at water that has a lot of color. We are assisting the state of Tennessee in its efforts to have the color content of discharges removed, which will, in turn, reduce dissolved solids to an acceptable level.

Moving on down, as I mentioned earlier, we have found, in Little River, which goes into Fort Loudoun Lake, we found some pollution from PCB that has appeared there.

Senator SASSER. Where is that PCB coming from?

Mr. DEAN. Nobody is sure. We are trying to—the last I heard, we didn't know exactly. It seems to be some that might have been up in the vicinity of Alcoa.

The answer is, we don't know exactly. We still know it is there. That is what you get into on these water quality problems. You find these strange things like over at Tellico. They found PCB's at Tellico—our newest, cleanest, most beautiful lake. If you must take a drink of water out of one of these dams, I would pick Tellico every time. I don't know if PCB's will make you sick, but it is not something we wanted to find over there.

Of course, Loudoun is stressed heavily because of the communities around there. They all put their industrial waste in there.

### NONPOINT SOURCE POLLUTION

The main thing to remember is that we are finding that nonpoint sources are more critical, in terms of damage, to the TVA lakes. That gets into everything from agricultural runoff to runoff from parking lots. These wastes don't go through treatment plants, so we have to consider ways to treat these that are different from what we are used to. It is like taking our storm sewers and putting them through their own treatment plants, which has not been a standard practice.

So we are looking at some things that we are in the forefront on, and we are looking at things that we will have to demonstrate. We will, hopefully, be able to talk farmers into leaving grassy plots alongside their row crops to keep all that goop from farming, such as fertilizers, from washing into the lake.

## COORDINATION WITH OTHER FEDERAL AGENCIES

Senator SASSER. Are any efforts being made to cooperate with other federal agencies in an effort to educate farmers and persuade farmers of the danger of this nonpoint pollution?

Mr. DEAN. Yes, sir; our soil and water 201 program refers to the 201 counties in the Tennessee Valley region. That program involves the agricultural colleges, TVA, the Soil Conservation Service, all the conservation groups are all working together to teach farmers, particularly in the western end of the region, how to grow crops without washing their land down into the Mississippi, where Senator Stennis has enough land already. We are working on that very hard, using new kinds of planters to plant soybeans, for instance, under the soil; different kinds of practices of all kinds. That is a cooperative effort that we are proud to be a part of.

## KENTUCKY LAKE STUDY

Senator SASSER. Let me ask you one more question before deferring to Senator Stennis here. Last year, you received funding for a special water quality study of Kentucky Lake. I know that that study is not yet complete. I know there is still considerable work to be done; that there is a task force addressing itself to the problems of Kentucky Lake, but could you give us an up-to-date report on any findings so far?

Mr. DEAN. Yes, sir; I know what we have done, and it involves a whole lot of sampling and testing, but I think I will take this opportunity to let Bevan Brown come talk about our findings on Kentucky Lake.

Senator SASSER. Mr. Brown, why don't you come to the witness table and give us a report?

Mr. DEAN. Mr. Brown spent his life studying the activities in these lakes.

Senator SASSER. Mr. Brown and I are familiar with each other, Mr. Chairman. We have done some studying together down in Hardin County.

Mr. DEAN. He said he went to Kentucky Lake with you, Senator.

Senator SASSER. Yes; he did.

Mr. BROWN. Yes, Senator Sasser, we have been together before, and as you stated, last year we were instructed to look into water quality problems. The issue is not only Kentucky Reservoir, but throughout the system of TVA reservoirs.

We are not prepared here to give you a full and complete report on our findings at this time. We actually have spent 6 months that we have been underway.

Senator SASSER. Pull that mike just a little closer.

## POSSIBLE CAUSES OF WATER QUALITY PROBLEM

I think we have discovered, and it has been brought to our attention partly through your efforts and others, just how fragile water resources are in the valley and throughout the nation. The factor that is affecting the water quality in Kentucky Reservoir more than we ever thought is dissolved oxygen.

We went through a 26-month drought in the valley and in the Southeast, it was the most extreme drought we ever had experienced. Apparently, as near as we can tell, this 26 months of drought resulted in a low amount of oxygen in Kentucky and many other reservoirs, which, in turn—you used the term—stressed the fish, and some of these factors had a dramatic effect on the fish, as you have witnessed yourself and as I have seen.

We also have discovered that the impact on reservoir water quality has been driven to a large measure, as the chairman said, by nonpoint sources. Approximately 80 percent or more of the effects, if you could collectively bring all the effects together, is nonpoint source.

We also discovered that Kentucky Reservoir, being a reservoir with a 40,000 square-mile drainage area and 160,000 acres of lake, the largest in the TVA system, is affected by many upstream activities. We have had more than 50 years of intervention by man into the water resources of the valley, including the extensive reservoir system. This intervention by man has brought to light a lot of factors that we have to consider very carefully in the future.

We have established a 15-person task force that you are familiar with. This task force has just completed, I believe this past week, a draft report on a plan to do something about all these issues. It is composed of three separate phases: An immediate action plan, an intermediate, and a final one. The final one would be one of those addressing nonpoint source issues.

You mentioned education, and what are we doing to educate people? I think that is something else we discovered. It is going to take a collective effort of all agencies involved in water and related activities, and it takes an education program in the farm sector and others.

We are doing some demonstrations all across the valley in waste treatment from farm activities, and we hope these take root and germinate into an effective program throughout the valley. It has been a revealing experience to all of us in TVA that have up to 40 years of prior experience in water resource management.

We accept the responsibility, and we are willing to give some time to these activities, and we think there is much to be done. Time would not permit, but I would like to submit for the record the things we are currently doing now to address in an effective, efficient manner these issues.

[The information follows:]

### WATER QUALITY ACTIVITIES

TVA's efforts include using the integrated water control system to provide sufficient quantity at critical points across the Tennessee Valley, to provide the monitoring necessary to identify problems and possible solutions, to develop plans for protecting water quality, and to provide public education. Because flow is a primary determinant of water quality and because most water quality problems extend across many state lines, we have a unique capability to apply to these problems. Our special activities include the following:

*Monitoring and assessment.*—This includes routine monitoring of ambient background as well as targeted monitoring where issues or problems are suspected.

*Water quality management plans.*—We develop and implement plans for managing water quality in our reservoirs. We use water quality modeling and field studies to determine the best allocation of waste loads. We also determine streamflow operations and reservoir use changes that may be necessary. These plans exist for Fort Loudoun, Tellico, Pickwick, Guntersville, Cherokee, and Boone Reservoirs.

*Correction of nonpoint source problems.*—A special threat to our reservoirs are nonpoint sources of pollutants. We are working with others to demonstrate low-cost, innovative corrective actions for nonpoint sources such as abandoned mine lands (mica and feldspar, Nolichucky River; manganese, South Holston River; copper, Ocoee River; coal, Upper Bear Creek Reservoir), animal wastes (Duck River, Bear Creek, Middle Fork Holston River, and Boone Reservoir), and small domestic wastewater flows (ANFLOW at Haleyville).

*Innovative demonstrations.*—We are demonstrating innovative monitoring techniques as well as waste treatment approaches. For example, we are using aerial photography to identify nonpoint sources from agriculture, mining, and failing septic tanks; 25 percent of the watershed has been inventoried (portions of Duck River and Bear Creek watersheds, Clinch/Powell basin, Boone Reservoir watershed, Town Creek watershed, and parts of South Holston and French Broad basins). We are also working to find waste treatment methods that can be used where large waste treatment plants are not appropriate and septic tanks will not work. A recent example is our demonstration of wetlands waste treatment techniques.

*Improving flows and dissolved oxygen below dams.*—We are proud of our aggressive program in this area which is providing minimum flow and improving dissolved oxygen levels in releases from TVA reservoirs where technology will permit. Our development of new techniques and approaches in this area is nationally significant.

*Public awareness.*—We are especially proud of the work we are doing with the public to involve them in protecting our reservoirs. A citizens water quality monitoring network was formed involving school teachers, canoe clubs, lake users groups, and other private citizens in TVA's monitoring effort. TVA is assisting valley citizens in establishing lake users groups on TVA reservoirs. These groups complement TVA monitoring efforts by being our "eyes and ears" on the reservoir and provide valuable input on the uses of the reservoirs. Groups are in operation on Boone and on Fort Loudoun Reservoirs, and a group is forming on Pickwick Reservoir.

*Ground water protection.*—We are assisting municipalities that rely on ground water supplies to identify the recharged areas for their aquifers and develop plans for protecting ground water quality. This includes working through local schools to educate the public about the value of ground water and its susceptibility to contamination.

These activities are closely coordinated with other federal and state programs to eliminate any duplication of effort and to ensure that the appropriate agencies are included in implementing management plan recommendations.

## ECONOMIC DEVELOPMENT PROGRAM

Senator SASSER. Thank you, Mr. Brown.

I want to ask you a couple more questions, but I want to defer now to Senator Stennis.

Senator Stennis, do you have any questions you would like to address to the witnesses at this time?

Chairman STENNIS. Mr. Chairman, I have already been given consent to file such additional questions as I may see fit, but how much money will you have for our economic development programs? Last year you asked for $11.7 million. That is the one program I am concerned about.

There is no request, as I understand it, for these programs in fiscal 1988; is that correct?

Mr. DEAN. That is correct, Senator.

Chairman STENNIS. Well, now, if we don't respond to the need by providing funding for these activities, what will happen? What can you do about it if we don't put the money in?

Mr. DEAN. Well, the answer to that very direct question is: If there is no money in there, these programs will have to cease. These programs are aimed primarily at creating jobs in rural counties that are our hardest hit counties. They would just have to cease, Senator.

Chairman STENNIS. Just bring them to a stop, that is what would happen.

Mr. DEAN. That is it; no money, no program.

Chairman STENNIS. I just wanted that to be brought out clearly and put into the record, because we run into Members sometimes that are not advised on what the real facts are. They think we are trying to stretch some figures around or are maybe we are mistaken; they think we are mistaken. I just want to show your firm, definitive answer that if we don't provide funding that you will be without money to take care of these important programs; is that right?

Mr. DEAN. That is correct, as it applies to economic development.

Chairman STENNIS. Yes; economic development. That is what we are talking about.

I think everybody knows, that has reviewed these matters, what the contribution is—they have some ideas about how much you are helping these communities. These communities are trying on their own, but they cannot do it all—they must have some assistance from elsewhere.

I don't have any charges that TVA is not spending the money wisely or that you are abusing your authority. You don't have any trouble of that nature, do you, with your program?

Mr. DEAN. No, sir; we are not being accused of being wasteful with the money. We don't really give any money away. We loan money sometimes for use in resolving funds to finance activities, but we don't give it away.

Chairman STENNIS. Yes; so really, the funding problem stops on our doorstep here, I mean, the membership here on this committee. It is up to us to get the facts first and then be willing to do something about it ourselves and also help convince and persuade others that are in a position to go forward with these programs. That is what it comes down to, isn't it?

Mr. DEAN. Yes, sir.

Chairman STENNIS. There is no question about that; that is the only place that TVA can get the money; is that right?

Mr. DEAN. That is correct; the money that the power program puts into industrial development is a separate matter.

Chairman STENNIS. Yes.

Mr. DEAN. That has to do with industrial development, not economic development.

Chairman STENNIS. I can testify to the fact that you have some men that really know what they are doing; their judgment is good; their activities are plentiful, bountiful, incessant; they never give up. They get value for the dollars they spend. You are representing them.

I think you are right up front of the issue here. We aren't going to abandon these matters and take the consequences of it, or are we going to try to do something about it? I think the consequences would be far beyond what anyone, what many realize now is very detrimental, injurious, and anyone that is a party to it will regret it.

But we have got to have this personal attention, and that is the purpose of the hearing here, too.

Mr. Chairman, I want to get those additional questions together and filed in accordance with the permission and authority given. I know you have others to testify today, do you not?

Senator SASSER. Yes; we do.

Chairman STENNIS. Well, I commend and thank all of you for what you have done and this highly important work. I have seen this come and go, now, for a good number of years. Even though there is talk and some slight criticism, I never have heard you being charged with a dishonest thing or willful neglect or being incapable. I think you have a very fine record in that way. The days are not gone, I don't think, in these positions here to pass on this money, but some modest amount, some modest amount would be provided.

Certainly, that is the purpose of all that I know that are interested here, and I believe that it has come out that way this year. Any time that you can do for others, the examples you can set, that is your duty, too, as I see it.

I am not trying to give you a lecture, but you are in issue, certainly. I certainly wish you well in your work and am going to support it.

Senator SASSER. Thank you very much, Senator Stennis, the chairman of the full Appropriations Committee. I know I speak for this board and all citizens of the Tennessee Valley area in expressing our appreciation for the wonderful support that you have given the TVA during many, many years and times when they were greatly embattled.

### CURRENT RAINFALL PREDICTION

Let me address just one more question to you, Mr. Brown, if I may, and I have two or three more questions for the chairman. Over the last 3 years, the Tennessee Valley has experienced the worst drought that we have had since we started keeping records over 100 years ago. That drought has had a terrible effect on not just agricultural endeavors, but also the water quality, the water in the TVA reservoirs and in other areas.

I understand that the rainfall has been above normal this winter, Mr. Brown. Is TVA projecting normal lake levels for 1987?

Mr. BROWN. Rainfall during the 5 out of the last 6 months has been normal or slightly above normal, which has been a welcome relief for us. At the present time, all of our reservoir levels are at the higher end of where they should be for this time of the year.

We are hoping that this also indicates a trend for the coming months and during the summer, as most people would like, that our lakes will be very high. Frankly, the months of April and May and the rainfall during those months have the largest, most significant impact on our ultimate reservoir levels for the summer.

To summarize, at the moment, we are in a very good position, especially as compared to the last 2 or 3 years, and thus far, at least, for the 5 out of 6 months, rainfall that is normal or above. So we are looking for a little bit different environment than I informed you about 2 years ago or about a year ago when we were in the midst of the drought.

Senator SASSER. Let's all pray for rain, then, in April and May.

### NONPOINT SOURCE POLLUTION

You indicated that about 80 percent of the pollution in Kentucky Lake you think tentatively may come from nonpoint sources. Of that 80 percent pollution from nonpoint sources, do you have any information at this juncture as to what portion of that could be ascribed to agricultural pollution?

Mr. BROWN. No; I do not, sir, at the present time. We do not have a separation made.

Senator SASSER. Will we be able to make a determination? Would it be possible to make a determination, Mr. Brown?

Mr. BROWN. One of the tasks proposed by the committee looking into Kentucky Lake is to develop techniques to quantify the different impacts of different activities on the water quality, and, thereby, we can better allocate future resources to address each of these particular problems.

Senator SASSER. But do we have the expertise now, TVA or anybody else, have the expertise at their disposal to make a determination as to how much of the nonpoint pollution really can be ascribed to agricultural sources?

I ask that question because I think that is going to be the toughest source of pollution to address, because you are going to have to deal with literally thousands of farmers, I suspect and educate thousands of farmers to alleviate that problem.

Mr. BROWN. We do have the expertise to make that determination, sir, and you are exactly correct. This is going to be a difficult problem to address, but it can be addressed.

I have enough faith in our system to believe that farmers are willing to do their appropriate share.

Senator SASSER. All right.

### TVA FUNDING LEVELS

Mr. Chairman, what level of funding did the Tennessee Valley Authority request from the OMB for next fiscal year?

Mr. DEAN. This year, you said?

Senator SASSER. This year.

Mr. DEAN. We requested $113.4 million.

Senator SASSER. $113.4 million?

Mr. DEAN. Yes, sir.

Senator SASSER. If you were to get a sum of approximately $100 million this year, where would you concentrate those funds?

Mr. DEAN. We would maintain essentially the programs we have, of course, with some minor modifications as you pointed out. We may find it necessary to shift funds into things that have emerged as critical problems, which you quite properly pointed out the water quality problem is a critical problem.

It may require some shifting around, but $100 million would leave us, in essence, flat with the year we are in now. It would be a maintenance-type situation, basically.

### POWER RATES

Senator SASSER. Let me ask you just a couple of power-related questions.

What are the prospects for holding down rates in the next 4 years? Have you made any projection on that at this point?

Mr. DEAN. Mr. Steffy, our manager of power, is here, and he made a talk the other day. He said there were things that were driving rates that we can't do a whole lot about. For instance, when we bring Watts Bar nuclear plant on line, we will save some money in fuel, but we will have to take depreciation from the plant, which will exceed our fuel savings, so that will have an effect of driving up the rates.

We also have, as you, I am sure, are quite aware, contracts with the Department of Energy which have some minimum bill provisions, and those will drop out of the picture; they will start dropping out in 1989, which is less than 4 years. Within the next 4 years, several of those contracts will expire, and that will have an effect, an upward pressure on rates.

Other things that affect rates are not as easy to predict. Coal prices are a little harder to predict. They tend to track crude oil prices, and we don't know from one day to the next what that is going to be. Interest is a big factor in our business, because we have a lot of borrowed money. Again, if I could predict that, I would be a Wall Street guru or something, but anyway, those are the main factors.

Senator SASSER. I judge that with regard to the prospects for holding down rates over the next few years, that is unclear at this juncture?

Mr. DEAN. Yes, sir; I have told you the factors we have to consider. Those are not easy to predict.

Mr. WATERS. Let me respond, Mr. Chairman. Certainly, Chairman Dean has correctly stated that we do believe that the efficiencies that we are putting into the power system now, and we are working very hard on efficiencies of the power system, that our best forecast, in my opinion, is that we will be able to maintain a good, competitive standing in power rates.

It is difficult to predict, of course, but it is my personal opinion that if we can put in place the efficiencies we are working on, we will be able to maintain the lowest residential rates in our area of the country, and we think we will be well within the competitive middle of the industrial commercial rates.

Now, that is more of an opinion of mine, and I don't want to indicate that that is an ironclad position, that we cannot fail here. We could. But I sincerely believe that we are going to be able to do that, barring just unforeseen events.

Mr. DEAN. Might I add to that, Senator? Our power people have been very innovative in their use of special rates for industries that, if we have surplus power to sell at certain times of the year, they are trying to make a real deal for industry to get that power at a fair competitive price. They are doing everything they can to encourage industry to stay in the valley and come to the valley.

I applaud their innovation.

Mr. WATERS. I would like to add one other thing, Mr. Chairman. There has been some statements made by others at committees that we are going to have a shortage of electrical energy in the Southeast and in the Tennessee Valley.

We don't intend to let that happen in the Tennessee Valley. Once again, barring any unforeseen events that we cannot control, we are going to have an adequate supply of electrical power to do the industrial development, create the new jobs and supply the people electrical power needed in the Tennessee Valley. I believe it.

### NUCLEAR POWER PROGRAM QUALITY ASSURANCE

Senator SASSER. Gentlemen, let me ask you this: The NRC is currently investigating a letter involving a so-called Appendix B or quality assurance issue. What do you expect to be the outcome of this investigation, and what is TVA's current relationship with the NRC?

Mr. DEAN. I think since that is very much a legal matter, and since Ed Christenbury has been sitting there quietly this morning, I think I will go ahead and let him discuss that.

Mr. CHRISTENBURY. Senator, I would rather not, at this juncture, speculate on where the NRC will come out with regard to the March 20 letter. They have had a number of the members from the Office of Investigation down talking to various TVA staff members in the Chattanooga office of nuclear power. They will issue a report at some point in time in the future.

I think it would probably be unfair, and maybe inaccurate, to speculate at this time. As to TVA's relationships with the NRC, I think that has been steadily improving. There was a meeting on Tuesday of this week with the NRC.

Jim Keppler, who is the Deputy Executive Director of Operations, has now been placed in charge of reviewing TVA's work and other special projects. Mr. Keppler chaired the meeting and seemed to be very pleased with the presentation that Admiral White made and the TVA staff made.

I think that to the extent there were communication problems in the past, we are along the road to improving the communications. Mr. Keppler seemed pleased with the progress that is being made. Admiral White deserves a great deal of credit in increasing and improving the relationships with the NRC.

As to NRC's Office of Investigation report, we will just have to simply wait and see where that comes out.

Senator SASSER. The bottom line is that things are looking up in the relationship between TVA and NRC, so would that be a fair assessment?

Mr. CHRISTENBURY. Certainly, in the communication area, which is one of the tough areas; I think we are working closer together in that regard; yes, sir.

Mr. WATERS. May I respond to that, Mr. Chairman?

Senator SASSER. All right.

Mr. WATERS. I think we have made significant improvement in our relations with the Nuclear Regulatory Commission. We had a communications problem; we have addressed that. We are working on it very hard.

We are going to do better; we are learning. Admiral White has brought some innovations in that are helping in that regard.

It is our intention and Admiral White's intention to be open and candid with the Nuclear Regulatory Commission, to recognize their responsibility. We want to have a safe system; and they do, too. So we are reading off the same sheet when it comes to that.

We have had problems in finding our difficulties in our plants before Admiral White came. We didn't find them all at once. As far as making any intentional misstatement to the NRC, this board has not done that, and I don't believe Admiral White has.

So I am willing to go a little bit further than we can maybe from a legal standpoint, Mr. Chairman, that we have not made any material misstatement; we don't intend to make a material misstatement; and I think that the subsequent record and the investigations will prove that.

Mr. DEAN. Mr. Chairman, Mr. Willis wanted to add something to a previous statement, if that is all right with you. It had to do with allocation of funds.

Senator SASSER. We would be pleased to hear from him.

### APPROPRIATED FUND PROGRAMS

Mr. WILLIS. It has to do with your opening statement, Mr. Chairman, about how we allocate funds and determine what our priorities ought to be with the scarce appropriated dollars. That is a responsibility of mine to bring these issues to the board to address. Our budget over the last few years has been a very skimpy-type budget.

Most of the budget goes to maintaining the facilities that we have, the dams and reservoirs, and maintaining the water quality and flow.

About 50 percent of our budget goes into natural resource programs; most of that into water programs. About 40 percent is in the agricultural program. A lot of that has gone into programs to protect our water flow/soil runoff initiatives.

We have about 10 percent of our dollars that we put into economic development, working with stressed communities and trying to create jobs where they are lost and get an economic base going in those areas.

Our problem has been in the last few years that in allocating those funds, about 80 or 90 percent is going to just maintaining those facilities and not letting them deteriorate to cause further problems. We have not had the resources we need to make improvements in water quality.

What Bevan Brown was talking about, we learned how delicate and fragile our water system is in the last few years, and we must direct more of our attention to new improvements and improving and addressing those problems than we have in the past.

That falls on myself and the staff to bring to the board a budget that will get at the problems. I am pleading with the committee and the chairman that our budget has been down to the point that where we are just maintaining the reservoirs at the status quo, and we are losing ground. We must increase the resources going into that program, whether it be, hopefully, new resources that come to the agency, but if not, we know our responsibility to the agency is to direct at water quality, because that is the backbone of economic development for the region, and we understand that.

## PERIODIC FLOODING

Senator SASSER. Thank you very much, Mr. Willis.

On one final topic, gentlemen. Mr. Brown and I had worked on this for a number of years, but I have been in consultation with a number of farmers in the Hardin County and Pickwick Dam area over a period of years, quite frankly. There, we are requesting that TVA purchase 6-month easements for some 40,000 to 50,000 acres of farmland that is subjected to periodic flooding.

On my last trip to Hardin County, which was last weekend, so it is fresh on my mind, they showed me charts which indicated that TVA purchased more extensive easements upstream than it did in their vicinity. This would seem to indicate that it seems to me at some point, TVA's intention was to flood the reservoir and not the river, as is now the case. It seems that river is getting flooded and their land is getting flooded.

Is the assumption correct that TVA's intention was originally to flood the reservoir rather than the river?

Mr. DEAN. This is a historical matter, and maybe Bill Willis can comment on it.

Mr. WILLIS. One thing we know is true, we did not buy the same type of easements at the upper end of Kentucky Reservoir, which is essentially a flowing river, that we did on the reservoir itself where flowage rights were needed to operate Kentucky Dam, and where we knew that there would be additional flooding problems from the operation of the dam. Things have changed over the years, Senator. In the early days, there was normally a single cropping pattern in that area.

In order to increase production, the farmers have gone to a two-cropping pattern which gets into the winter months. From the historical records that I can read, we knew in the beginning that there would be some flooding in those areas from natural conditions just as there was before the construction of the TVA reservoir system, but we did not anticipate any harm because of the single cropping pattern. The two-cropping pattern is causing a problem for the farmers today.

We are aware of that. I would like Bevan to give a better answer on flooding the river versus the reservoir concept. He has that history.

Mr. BROWN. Senator, as you know, as part of the reservoir, the Kentucky Reservoir is in the transition between reservoir flooding and river flooding, and as the general manager said, the easements that we did acquire when the Kentucky Lake was built were the necessary easements to operate the reservoir and did not include any easements with respect to the natural flooding of the river.

This, because of the double cropping practice, has changed the situation, especially beginning in the late sixties and continuing today. We are looking into that. I would like to come back and discuss the different alternatives with you in greater depth.

One of the things which we did do when we acquired the easements, we only acquired the right to flood the land but no right to limit the use of the land at that time.

Second-guessing what was done some 40 years ago, it might appear it would have been better to have limited some uses of the land and you could second-guess a lot of things that were done. I think more importantly, what are we going to do about this problem in the future? We have been able to do some things recently, and I hope you are informed of that.

We had some flooding recently, and the farmers requested that we take deliberate actions to get the water off the land as quickly as possible as opposed to gradually. We took those actions and that changed. Within our capability, we have been doing everything we could to minimize the adverse effects on the farmers.

That does not, in any way, offset the fact that it is an adverse effect on some very prime farmland in a significant part of the valley.

Senator SASSER. I appreciate your comments on that, and we have wrestled with this thing for sometime. It would appear that the best solution would be to purchase easements for this property.

Has TVA determined what the cost of these easements might be?

Mr. BROWN. We are in the process of making some rough estimates as to what this cost might be, sir.

Senator SASSER. When those become available, would you be good enough to furnish them to me, Mr. Brown?

Mr. BROWN. We would be pleased to.

Senator SASSER. I have no further questions unless you do, Mr. Chairman.

Chairman STENNIS. I believe not, Mr. Chairman.

Senator SASSER. Thank you very much, gentlemen. We very much appreciate your appearing this morning and testifying and giving us the benefit of your views, and I want to tell you that this committee—I believe I can speak for Senator Stennis in saying this—is going to work diligently to see if we can't raise the amount that has been allocated to TVA by the administration's budget.

Thank you, gentlemen.

Mr. DEAN. Thank you.

Mr. WATERS. Thank you, Senator.

### ADDITIONAL SUBMITTED QUESTIONS

Senator SASSER. And I will place those additional questions in the record at this point.

Again, thank you for your testimony today.

[The following questions were not asked at the hearing but were submitted to the Authority for response for the record:]

## QUESTIONS SUBMITTED BY SENATOR SASSER

1. Question: TVA's appropriated budget has been reduced significantly since 1980. Have these reductions impacted TVA's ability to respond to the needs of the Valley and the Nation? What would be the primary effects of the President's proposed funding for fiscal year 1988?

Answer: The total appropriation to TVA in 1980 was $220 million. In 1980, as in several subsequent years, there were items included that can be considered to be extraordinary, usually associated with single, nonrecurring activities. We exclude such items from our funding analyses so as to focus more properly on projects and programs of a continuing nature. Even using this conservative analysis, between 1980 and 1987 TVA's appropriated budget has been reduced from $160 million to $100 million--a 37 percent cut in a seven-year period. These budget cuts have not paralyzed TVA. For example, despite a substantial cut of Federal funds, TVA has continued its basic work in water quality, waste management, recreation, environmental education, and forestry.

However, for fiscal year 1988 the Administration has asked Congress to appropriate $73 million to TVA. Although not as drastic as last year's proposed cuts, it would still reduce TVA's current $100 million budget by an additional 27 percent.

We welcome the fact that this year the Administration's budget acknowledges the value of TVA's Agricultural Institute and biomass programs, as well as the value of maintaining TVA's Land Between The Lakes.

The proposed cuts would eliminate TVA's economic development programs and much of TVA's work in agriculture, natural resources, and reservoir system operations. At your request, we have prepared a more detailed analysis of the proposed cuts.

Last year the Tennessee River basin--and the rest of the Southeast--suffered one of its worst droughts in history. To meet this crisis, TVA established a drought task force to provide technical information and assistance to State and local governments.

In economic and community development TVA has targeted reduced funding on two fundamental problems: helping Valley region residents develop the appropriate skills to meet the challenges of a rapidly changing economy, and assisting the Valley region's most financially distressed areas so that citizens living there have an opportunity to join the Nation's economic mainstream.

- Between 1984 and 1986 more than 54,000 Valley residents received training under TVA's skills program and more than $770 million was added to the region's economy due to increased wages.
- Between 1984 and 1986 TVA's existing industries program has helped 630 Valley region firms create more than 22,000 new jobs.
- TVA's special opportunities counties and cities program has helped citizens in the Valley region's poorest areas to identify and capitalize on their local resources. Between 1984 and 1986 the program helped generate almost 6,000 new jobs. For every dollar invested in 1986, almost eight additional dollars were leveraged from other public and private sources.

Funding for TVA fertilizer research and development has been reduced from $6 million to $4.4 million during the last seven years--a 27 percent cut. Yet, we continue to serve the Nation and carry on important research, which has been responsible for patents used to produce 75 percent of all fertilizers currently used by American farmers.

During the past seven years, TVA has reevaluated its priorities, strengthened its ties with other public institutions, and encouraged private sector cooperation and support for its efforts. In responding to these changing times, TVA has remained true to its mandated responsibilities as a regional and national demonstration.

2. Question: What level of funding did TVA request from OMB? What was the basis for this request?

Answer: TVA requested $113.4 million for fiscal year 1988. It is essentially the spending level which existed in 1986.

3. Question: Was your request to OMB sufficient to meet the needs of the Valley?

Answer: No. It was a tight budget request that we hoped the Administration could support within its overall budgetary goals.

4. Question: What additional funds would be necessary?

Answer: An increase to about $120 million would return us to the 1986 level adjusted for inflation. It could also provide funding to strengthen programs making significant contributions to the well-being of the Valley and demonstrating new ideas to the Nation.

5. Question: Where would these funds be applied?

Answer: Most of TVA's programs would function at the 1986 level. There could be limited expansion in three priority areas: concrete steps to correct existing water quality problems in Kentucky Reservoir and other TVA lakes and streams; a package of financial/technical assistance to rural development; and expansion of a national institute on development and transfer of technology for management of effluents and of solid and hazardous wastes.

TVA could also strengthen its traditional role in developing and demonstrating new fertilizer production technology by examining financial incentive to expand joint ventures and partnerships with the private sector.

### Water Quality and Kentucky Reservoir Cleanup

In the Tennessee Valley there is, for the most part, sufficient water to ensure the continued development of the region. The fragile nature of this resource became all too obvious during the drought of 1986. Huge volumes of water devoid of oxygen, infestations of noxious aquatic weeds, stressed and diseased fish, dying freshwater mussels, drinking water with objectionable taste and odor, algae blooms and drinking water contaminated with carcinogenic compounds were all documented during the record-setting drought.

Kentucky Reservoir. While these problems occurred throughout the Tennessee Valley, almost all were prevalent on Kentucky Reservoir where they were least expected. During 1986 water quality in Kentucky Reservoir emerged as a major issue to the public, water resource professionals, and the region's political leaders. The value of the reservoir to the region's economy and the urgency with which the public views these issues makes it necessary that special attention and efforts be given to solving the water quality problems of this reservoir. A task force of concerned citizens and Federal and State agencies has been convened to develop and implement a comprehensive plan of action. While all roles and responsibilities for implementing sections of the action plan are not yet delineated, TVA has both expertise and management responsibilities which make it the logical agency to lead several major tasks of the plan. These include: the development of a two-dimensional predictive water quality model, identification and prioritization of nonpoint sources of pollution, control of invading aquatic weeds, and the development of a reservoir water quality management plan.

Targeted Monitoring. In addition to the problems discussed above, the continued occurrence of problems such as PCB-contaminated fish in Tellico Reservoir or carcinogens at Calvert City, indicates a need for systematic data gathering to identify trends and to determine the location and extent of threats to water quality and supply before they reach critical stages. Such monitoring could prevent crises such as sewage sludge at Boone Lake back in the summer of 1983. This would be accomplished through targeted chemical and biological monitoring conducted at selected locations within each of twelve subwatersheds in the Valley. This would provide a current water resources data base for the entire Valley by fiscal year 1991.

Reservoir Water Quality Management Plans. A third area which must be addressed before TVA can adequately manage the water resources entrusted to it is reservoir water quality management planning. These plans identify water quality conditions which threaten or impair reservoir uses, describe how point and nonpoint sources of pollution affect reservoir water quality, and delineate actions needed to correct existing problems and to prevent future problems. Management plans have been completed and are being implemented for six reservoirs. These plans and subsequent implementation activities are in high demand by the public and by State agencies, which use them to assist in regulatory decisions and to target their limited resources for compliance, enforcement, and data gathering efforts. TVA uses these plans to guide its operation and maintenance of dams and reservoirs, in managing reservoir properties, and in review of proposed shoreline activities. The immediate need for implementation of the six completed plans has prevented the startup of new projects the past three years.

Current funding for reservoir management is not adequate to meet demands of the large TVA system with serious water quality problems in 20 of the reservoirs. Because of the importance of water quality in achieving maximum benefits from the reservoir system, it is essential that a systematic approach to water quality management be implemented. Failure to do so will allow water quality problems to go undiagnosed and untreated until their severity becomes so obvious to the public that immediate action is demanded.

## Rural Development

Over the past two decades, the people of the rural South have experienced fast-changing economic conditions which now threaten their very existence. Increased farm mechanization altered the fundamental economics of agriculture, posing a serious threat to the traditional small family farms of the South. In order to keep their farms and maintain their rural lifestyles, people sought off-farm employment to supplement their incomes. In the 1970s the South successfully attracted industry based on this supply of eager, productive, low-wage workers. However, many of these same industries have now begun to move overseas to secure even cheaper labor. At the same time, the Federal Government has significantly decreased or eliminated economic development programs, farm price supports, and education and training programs which in previous years helped soften the impacts of economic change.

In short, the rural South is facing a crisis. Its people cling desperately to land their families have owned for generations but which is only marginally productive in today's economy. Most have less than a high school education and are ill-prepared for the specific skills demanded by the industries that remain. Innovative ways of strengthening rural economies and preparing them for the future must be sought and must be sought quickly. In the short term, jobs must be created and methods to supplement farm incomes must be demonstrated. In the longer term, education and training programs must be put in place so that the next generation in the rural South can compete in the changing marketplace.

In many respects, these problems appear almost insurmountable. They are not. While no magic solution exists, there are ways to help preserve rural living and create needed jobs in the South. The Tennessee Valley Authority proposes to embark upon a multiyear rural development initiative which will demonstrate to the entire Nation innovative ways of creating jobs and strengthening the economies of rural areas.

Why TVA? There are three principal reasons why we believe the Tennessee Valley Authority is uniquely qualified to undertake a national rural development initiative. First and foremost, TVA has the experience. TVA has lived and worked with the people of the Tennessee Valley region for over fifty years, helping introduce electricity, desperately needed resource conservation techniques, and economic improvements to a rural population which was almost totally isolated in the 1930s. TVA has been here during the evolution of State and local governments and their development agencies, and we have formed the working partnerships necessary to undertake this new challenge to the rural South.

Second, TVA has the expertise. Despite severe budget cuts in recent years, we have maintained expertise in engineering, economics, science, education, and planning which allow us to conduct efforts such as industrial development, existing industries program, skills and education development, special opportunities counties and cities, and agricultural development which are primarily directed to rural areas. In addition, we have over the past two years piloted some new approaches to rural job creation which have proven successful and are ready for broader application. Among these new tools are efforts to stimulate the service sector of rural areas, leadership development programs, literacy and basic educational improvement efforts, and sophisticated multicounty marketing techniques.

Finally, TVA has throughout its history endorsed unified resource development efforts. These problems facing the rural South are difficult and complex; single-purpose approaches will no longer suffice. TVA has proven its ability to blend its unique range of expertise to tailor solutions to particular problems. We believe this demonstrated capability is critical in addressing the future of the rural South.

The Proposal. The problems facing the rural South require immediate attention. Personal income is less than 67 percent of the national average in half the region's 201 counties. In 75 TVA counties, more than 20 percent of the residents are below the poverty level. Even more staggering, in 150 of the 201 Valley counties less than half the people 25 and older have finished high school.

TVA proposes to focus its rural development initiative in three primary areas: the Cumberland Plateau of Tennessee, the 30 Mississippi counties in the TVA region, and rural north Alabama. These areas differ in geography and population characteristics, but all have experienced the longstanding economic problems of the rural South.

Because the problems facing these rural areas are so complex, TVA proposes to implement a broad range of programs designed to create new jobs, increase personal incomes, and improve education and skill levels. Examples of the efforts TVA would initiate in partnerships with local leaders include:

o Innovative job creation projects. TVA has the tools to help create jobs in many different sectors of the rural economy. Our existing industries program has helped create over 10,000 new jobs in the past year by delivering critical technical services to manufacturers trying to expand. A new commercial business development effort has helped generate 137 new jobs in Starkville, Mississippi's trade and service sector, and TVA is now working with several other pilot communities in the region on this new approach. Oftentimes a single barrier can prevent the creation of new jobs in a rural area. TVA has filled these voids many times through its special opportunities counties and cities program, helping build a water or sewer line to serve a specific industry, constructing a building to house a new employer, and making the critical difference between success and failure in rural economic development. TVA will use these and other job-creating tools to meet the specific needs of rural communities, tailoring projects which fit the resources and opportunities that exist in these economically troubled areas.

o Agricultural development demonstrations. TVA has a well-established record of helping improve the efficiency of farming in the region. As the farm crisis worsens, attention must be focused on what to produce, how to market production, and how to effectively recycle wastes. TVA will work with cooperators and demonstration farms in the three target areas to show how new and emerging technologies can enhance the family farm's contribution to income generation and hence job creation in the rural South.

o Skills and education improvement efforts. Valley-wide, TVA has helped train 35,000 workers over the past two years. We have also conducted demonstrations in literacy, basic education such as math and science, high school equivalency certificates, and high-technology training. TVA now proposes to put these various efforts together to demonstrate how illiterate rural adults can be taught to read, helped to complete high school, and trained for specific job opportunities.

### Waste Management Institute

Waste management is becoming an increasingly important national and international issue. Indiscriminate disposal of hazardous waste poses a significant threat to our Nation's most vital natural resources--land, air, and water. As public concern over land disposal mounts, Congress has turned toward waste minimization and treatment programs to combat the problem. As pending bans on land disposal are implemented, new facilities employing improved technologies will be needed to manage those residual wastes that cannot otherwise be avoided through minimization efforts. Additionally, absence of viable waste management systems adversely impacts economic growth and development. Capital and energy costs have made traditional wastewater treatment systems beyond the reach of many communities. Evaluation of new, more dependable technologies must be accompanied by information and education programs aimed toward the general public and the environmental professional. Because waste management is such a complex problem, attempts to solve it in a piecemeal fashion have been unsuccessful and thus not accepted by the public.

Proposal. A Waste Management Institute has been created as an umbrella coordinating management structure with initial centers for hazardous waste training and information, technology clearinghouse, and technology development. The Institute will seek guidance in carrying out future activities from a steering committee including members from the newly formed EPA/TVA Environmental Roundtable on Hazardous Waste. Under the Institute TVA proposes a major initiative in hazardous waste management utilizing the agency's demonstrated strengths in regional resource management, chemical development, public participation, education and training, economic development, boiler technology, and construction and operation of large-scale demonstrations in an integrated manner. TVA has operational and demonstration facilities (e.g., utility boilers, fluidized-bed combustion, and gasification units) where capital investments have already been made that could be utilized, at significant savings, to demonstrate hazardous waste destruction methods with both regional and national applications. TVA's prototype demonstrations in wetlands waste treatment provide expertise for blending design and operational concepts into the Institute's training component and to begin improved systems development. In addition to in-house expertise and facilities TVA will work with the Oak Ridge National Laboratory, the University of Tennessee, other Valley universities, and State and Federal agencies to carry out cooperative projects. TVA will bring these and other entities together and act as a catalyst for continuing, cooperative efforts. Public participation groups, the Valley environmental network, and State and Federal regulatory agencies have endorsed a broad-based hazardous waste initiative by TVA. Additional appropriations will be required in order to establish the training center, technology clearinghouse, technology development center, and to complete the detailed engineering, environmental, and economic assessment for a major thermal technology demonstration. A preliminary technology assessment will begin in fiscal year 1987 utilizing present manpower and resources. Additional appropriations would also be used in partnership with funds from other sources that have interests and responsibilities for hazardous waste management, including EPA, DOD, DOE, and EPRI. The goals of the program are to make the training center and the clearinghouse functions completely self-financing within three to five years. The technology development center should require only limited appropriations after the first five years.

Fertilizer Technology

Proposal. In 1983 the President's Private Sector Survey on Cost Control recommended that NFDC seek alternative funding sources to reduce or eliminate the need for tax dollars. An intensive effort was initiated in fiscal year 1986 to generate private sector funding. Projects ranged from laboratory and pilot-plant test work to marketing studies and field engineering to solve industry problems. About $700,000 was raised in 1986 from the private sector.

During 1986 NFDC scientists and engineers contacted a large portion of the fertilizer industry. Numerous projects were identified, but could not be implemented because of a lack of funds for research or for capital investments. The economic state of the fertilizer industry is such that almost all companies are operating in the "red." Many have closed their doors and probably will not reopen. Few companies have any capital to invest in projects with NFDC. Because NFDC's budget has been reduced the past several years, it has had little funding to invest in joint ventures with industry. If additional appropriations were provided for fiscal year 1988 to finance new research and joint ventures, projects with payback could be implemented to solve industry's problems and bring in more private financing for NFDC activities. Because of NFDC's highly trained staff and modern laboratories and pilot plants, many high-risk projects would have a good chance to be successfully completed.

The initial project in such an effort would be to construct a portable plant to produce ammonium polyphosphate suspension fertilizers. Patented TVA technology would be used and royalty fees collected. One company, Florida Favorite Fertilizers, Clewiston, Florida, has indicated a willingness to enter into a contract with TVA to lease or purchase this plant and pay appropriate fees to TVA. Other companies have expressed an interest in this technology as well as other TVA patented technologies. Use of portable plants will expedite adoption of these technologies, with the resultant advantages of reduced operating costs and energy use and improved product quality.

Another project would be the installation in one or more industry plants of TVA's patented pressurized pipe reactor process to make diammonium phosphate (DAP). This technology increases the production capacity of existing plants, thereby reducing the cost of production. Moreover, the plant operation is simplified and use of fossil fuels is eliminated.

TVA would install the pipe reactor and collect a tonnage fee to recover the installation cost. Also, continuing royalty fees would be collected for a license to use the technology. Since about 12 million tons of DAP is produced annually in the U.S., industry adoption of this technology would offer the possibility of sizable royalty payments to TVA.

6. Question: Please describe current fertilizer market conditions and the resultant financial condition of your fertilizer program.

Answer: The fertilizer industry is in trouble, primarily from the uncertainty of America's farm program, increasing imports of urea and other nitrogen sources from mainly Communist-bloc countries, and the continuing decline of world fertilizer prices.

However, there has been some stabilizing of prices since the beginning of the calendar year, with nitrogen prices, for instance, up about 20 percent from their low point.

TVA's National Fertilizer Development Center has been able to weather the storm over the last several years, although personnel reductions in key areas have been required. We are pursuing lower natural gas costs for our ammonia plant in an effort to further reduce program costs.

We are taking other steps to improve our cash flow, and we anticipate maintaining our viability through fiscal year 1988. However, the situation remains serious, and further deterioration of the fertilizer market could result in additional program cutbacks and personnel reductions.

7. Question: Please describe your current program for charging fees for services delivered by your various programs.

Answer: The private sector supplies approximately 36 percent of the funding for TVA's national fertilizer program at Muscle Shoals. This money comes from fertilizer sales, cooperative ventures, user fees, and royalty income. An additional 7 percent of total program funding comes through reimbursable service contracts with other agencies (DOE, DOD, AID).

TVA has also implemented a patent licensing pilot program in which a few previously unlicensed patents will be licensed for royalties, reasonable fees, or both. This departure from TVA's current licensing policy (in which its patents are licensed on a nonexclusive, royalty-free basis for a nominal fee) will, if successful, enable TVA to recover a greater portion of its research and development costs through patent-related income.

TVA's natural resources programs secure fees for a variety of services.

In the operation of the reservoir system, fees are charged for boat dock licensing, use of agricultural lands around the reservoirs, and use of developed campgrounds. Other income comes from the sale of timber as it is determined available for cutting.

TVA also charges fees for use of developed facilities at LBL, including The Homeplace-1850, Empire Farm environmental center, and Woodlands Nature Center. Fees are also charged for general hunter use permits.

In total, we expect to generate between $2 million and $3 million in fees in 1987.

8. Question: Where would TVA concentrate any funds received that would restore the President's recommended funding level of $72 million to last year's level of $100 million.

Answer: Any restoration of funding would improve TVA's ability to maintain its regional and national demonstrations in such diverse areas as economic development, natural resource management, and fertilizer research.

The economic resources programs, completely eliminated by the proposed reductions, would be continued to help revitalize the impoverished areas of the Valley region, increase the skills of the unemployed or underemployed, and help create new business or make existing businesses more competitive.

TVA would restore or strengthen programs involved in its role as protector and manager of the area's natural resources. Water quality activities would be strengthened to more adequate levels. Recreation, wildlife and timber management, environmental education, and air quality research and monitoring programs would be restored to a minimal level.

The severe restrictions on fertilizer research and development would be eased, allowing for continued work on suspension fertilizers, granulation processes, and waste recovery and utilization. Fertilizer technology development activities could maintain a higher level of performance in new process research and testing.

Restoration of TVA's budget to at least the $100 million level would better equip the agency to continue its important role in the Valley region and in the Nation.

9. Question: What has TVA done to reduce instances of harrassment and intimidation and to restore morale?

Answer: Since January 1986 a concerted campaign has been under way to make clear TVA's policy that intimidation and harrassment (I&H) will not be tolerated. One of the earliest efforts involved meetings with Mr. White and over 9,600 nuclear power employees, covering each plant site, Chattanooga, and Knoxville. Subsequently, the substance of the discussions with Mr. White was reprinted in UPFRONT, the Office of Nuclear Power newsletter, and distributed to all employees. Since that time, the policy has been reemphasized in over 25 various other publications, notices, brochures and memoranda. Also, in February 1986, the new Employee Concerns Program was established to increase both employee and supervisory awareness of I&H policy and to provide an avenue for redress should further instances occur. Additionally, with the creation of TVA's Office of Inspector General, which operates a "hotline" for employee calls, TVA has established an avenue for employees who might otherwise be unwilling to voice their concerns to TVA Nuclear management.

In addition to creating mechanisms to address employee concerns, efforts have been directed to establishing a management culture whereby managers will communicate with their employees and address problems and concerns more quickly. In October 1986 an I&H pamphlet was developed and issued to all ONP employees. This pamphlet discussed I&H and provided questions and answers on the subject illustrating circumstances where otherwise innocent and well intentioned actions could be interpreted as I&H.

Actions have been taken where I&H or the perception of I&H were found. To date, there have been approximately 20 specific instances in which disciplinary action, up to and including termination, have been taken in cases where I&H was substantiated. On the other hand, in a case where a former policy, which required automatic suspension or dismissal in cases where employees violated quality assurance rules or procedures, created a perception of I&H, Mr. White canceled the policy and ordered a reduction in penalties for 10 employees and expunged the files for 32 others.

ONP is also conducting a training program for managers to help them avoid actions which result in I&H or perceptions of I&H.

In summary, a tremendous amount of effort is being expended in investigating and resolving employee concerns, including those involving I&H. The root causes of I&H are known; they are the same as those leading to improper management. Aggressive programs are in place to correct our management problems which will include the elimination of I&H.

10. Question: What are the prospects for holding rates down over the next few years?

Answer: The outlook for electric rates depends on many factors. These include, among other things: inflation, fuel costs, interest costs, the completion of nuclear plants under construction, and the costs of operating and maintaining plants. Increases in electric rates over the next few years will be determined largely by the commercial operation of the Watts Bar Nuclear Plant. When both units at the Watts Bar plant go into operation, electric rates are projected to increase approximately 5 percent. In addition, over the next few years the writeoff of previously canceled nuclear plants will cause rates to increase approximately 4 percent. Another unknown is the impact of acid rain legislation. We expect the most likley impact of legislation would be to cause rates to increase in a range from 5 percent to

15 percent for future years. Finally, a significant decrease in DOE revenues is expected to occur in the early 1990s which could have some effect on rates, depending on the amount of replacement sales that might be made at that time.

TVA continues to make every effort to provide an adequate supply of power at the lowest feasible cost to the ratepayers.

11. Question: How would you describe the degree of cooperation between TVA and the NRC?

Answer: The NRC has a job to do and we appreciate how difficult that is. We do not expect them to treat us any differently than they do any other licensee.

In the past there have been communications problems between the two organizations, but a recent special joint effort between us resulted in improvements. We believe further improvements will result with the new NRC project team that has been assigned to TVA. We are making every effort to provide NRC with complete information and access to facilities in order that they may do a thorough and timely review of our activities. We believe the NRC has performed their reviews in a professional manner.

12. Question: What would be the impact on energy supply and rates of terminating the four nuclear units not yet licensed?

Answer: TVA is currently evaluating the effect on energy supply and rates of the return to service for its nuclear units. This evaluation will include an analysis of the best alternatives available for four nuclear units under construction at Watts Bar and Bellefonte.

The current power supply outlook indicates that both Watts Bar and Bellefonte are needed to provide an adequate supply of power in the early 1990s and mid-1990s, respectively, if TVA experiences high load growth. With high load growth, termination of these units would require immediate replacement capacity in addition to purchases of power or the addition of high-operating-cost combustion turbines.

With TVA's midrange outlook for load growth, TVA needs the Watts Bar plant in the mid-1990s and the Bellefonte Nuclear Plant in the late 1990s. The cancellation of Watts Bar would require the immediate replacement of this capacity. The cancellation of Bellefonte would require a decision on replacement capacity in the early 1990s.

With TVA's low load growth outlook, Watts Bar and Bellefonte are not needed until after the year 2000.

A 1985 analysis indicated that the completion of Bellefonte would result in lower rates than would the cancellation of construction at Bellefonte. Since Watts Bar has a lower cost to complete and is needed before Bellefonte in order to provide an adequate supply of power, on the basis of that 1985 analysis the completion of Watts Bar would meet the needs of the ratepayer at lower costs compared to its cancellation.

13. Question: Please discuss the various issues associated with the DOE demand charge.

Answer: (In this answer "DOE" refers to either the Department of Energy or to its predecessor, the Atomic Energy Commission.)

Before the current contracts were signed in 1967, DOE approached TVA and requested TVA to make available very large amounts of power for the Oak Ridge and Paducah enrichment plants, beginning in 1971. At the time, it was recognized by the parties that this would require tremendous obligations for facility investments by TVA to make available the vast amounts of power DOE wanted. (While having the option to do so, DOE, at that time, did not wish to undertake the risk associated with providing its own generating facilities. Nor did it wish to enter into arrangements whereby TVA would build and dedicate specific generating plants for serving the DOE loads. Instead, DOE wanted, and TVA agreed, to enter into the contractual arrangements whereby DOE's enrichment plants would be served from the overall TVA system, as are all other customers served by TVA.)

Consistent with minimum payment provisions of TVA's power contracts with other large industrial users, the contractual arrangements with DOE provided for capacity (demand) charges to be paid for the term of the contracts. Such provisions help assure that, at least for the term of the contract, payments will be received to help recover costs incurred by the electric system in constructing facilities to serve its loads. Such fixed costs, of course, continue for the TVA system whether or not a customer such as DOE chooses to use all the power for which it contracted.

In accord with the arrangements whereby service to the DOE facilities was to be provided from the overall TVA system, the contractual arrangements agreed to by the parties provided for rates and charges based on TVA's prevailing general power rates as modified or replaced from time to time. Moreover, after extended discussions, including recognition of the very large fixed-cost risks being incurred by TVA (which would extend even beyond the contract term), it was agreed in entering into the contracts that the capacity charge would be 45¢ higher than the standard demand charge, but that, in turn, the energy charge would be lower than the standard energy charge. As provided under the contracts, these rates and charges through the years have been revised as necessary to reflect modifications and replacements of the prevailing rate schedule.

DOE not only initially contracted under those terms--it subsequently approached TVA on a number of later occasions between 1968-1974 insisting on contract amendments providing for vast additional amounts of power to be made available at specified future times at levels which reached 4,485 MW in July 1984. In contracting to make these large amounts of additional power available, it was necessary for TVA to undertake the construction on its system of very costly additional generating facilities. TVA continues to be obligated to cover such fixed costs that have been incurred in constructing such facilities for serving system requirements.

It was not until fiscal year 1981 that DOE chose to utilize less power than it had contracted for. This decision by DOE does not provide a basis for being relieved of its obligations through the term of the contract. If TVA were to now relieve DOE of its contract obligation, it would result in an unfair shifting of costs to TVA's other customers through rates that would be about 12 percent higher than the present rates (90 percent higher if only applied to large industrial customers). Moreover, all other industrial users similarly situated would demand to be likewise relieved of their obligation when their power use drops significantly. However, TVA has worked with DOE on a number of occasions to try to help identify means whereby DOE could use different types of electric energy or otherwise reduce its costs in ways that would not improperly shift to other ratepayers DOE's cost obligations.

Over the years the parties carried out their respective obligations as set out in the contracts. However, DOE has recently been pursuing ways to avoid payment obligations under the contracts. In this regard, DOE last year urged that TVA utilize a different cost classification approach in establishing rates that would have the effect of lowering charges to DOE but raising them for others. More recently, DOE has suggested that it should pay rates and charges less than those reflecting TVA's prevailing general power rate. This would be inconsistent with the contract provisions that provide for rates and charges based on the prevailing rates. The prevailing rates, of course, reflect overall system costs being incurred. If DOE were to pay less, it would unfairly shift to other ratepayers the responsibility for a portion of such costs. TVA and DOE representatives presently are involved in discussions about the arrangements and are looking for opportunities, consistent with the contractual obligations, that would achieve savings for DOE. Any arrangements between the parties should, of course, be such that would not shift costs unfairly to other TVA ratepayers.

The following paper provides a more detailed summary about the TVA/DOE contractual arrangements.

## ELECTRIC POWER CONTRACTS
## DOE-TVA

- The present contracts (one for power supply to the Oak Ridge project; one for the Paducah project) were entered into in 1967, and subsequently amended in 1968 to increase to 3,165,000 kW the amount of power to be made available by TVA. At the insistence of DOE (at that time, the AEC), the contracts were further amended in 1973 and 1974, increasing the amounts of power to be made available by TVA to 4,485,000 kW. Under the contracts, these increases (which were for additional power for the special "CIP" and "CUP" programs) were to be effective no later than 1983-1984. Thus, in addition to providing facilities to make available the 3,165,000 kW of power, TVA at the time it entered into the contract amendments in 1973 and 1974, had to begin constructing facilities necessary to be in a position to supply that additional 1,320,000 kW. It was not until years later, during fiscal year 1981 (after TVA had spent tremendous sums of money to provide generating and transmission capacity necessary to supply the very large amounts of power DOE requested and contracted for), that DOE's use of power fell below the amounts that it had contracted to be made available.

- The term of each contract, as amended, began in 1971 and continues through June 1990, and from year to year thereafter through June 1995, unless terminated earlier by either party upon notice of a reduction to zero (in successive steps of not more than 1,000,000 kW per year beginning no earlier than 8 years after notice) of the aggregate amount of power to be made available. By a series of notification letters beginning in late 1981, DOE has exercised its right under the contracts to reduce the aggregate contract demand from the 4,485,000-kW level by successive 1,000,000 kW increments effective in December of 1989, 1990, 1991, and 1992, and by 485,000 kW effective in March 1994 (collectively resulting in an aggregate contract demand of zero kW effective in March 1994).

- The charges applicable under the contracts are based on TVA's prevailing rates. The present capacity (demand) charge under the contracts is $12.05 per month per kW, and the present energy charge is 2.107 cents per kWh for the energy used. The total billing is reduced by 5 percent because, under the TVA Act, TVA makes no in-lieu-of-tax payments based on sales to DOE. The capacity charge is applied monthly to not less than 85 percent of DOE's contract demand under each contract (currently 4,485,000 kW in the aggregate). Energy charges are applicable only for the energy used by DOE.

- Consistent with the obligations in TVA's power contracts with other large electricity users, DOE's obligation to pay capacity charges continues for the contract term regardless of DOE's actual level of use of the power which it contracted for TVA to make available. If these capacity charges were not paid by DOE, fixed costs incurred in providing capacity to serve DOE's facilities would have to be recovered from other customers through higher rates. If TVA were to relieve DOE of its contract obligations and these lost revenues were recovered from the other large industrial customers in the TVA region, it would necessitate an increase in charges of over 90 percent for fiscal year 1987, based on the October 1986 rates. (If the lost revenues were recovered from all consumers--residential, commercial, and industrial--it would necessitate an increase of almost 12 percent for all of these consumers.) Of course, such unfair shifting of costs would not be for just a year, but would extend for the remaining term of the DOE contracts. Moreover, if DOE were to be relieved of its payment obligations, other customers with large loads would expect and demand that they, too, be relieved of such payment obligations. If this were to occur, it could only result in further improper shifting of costs to other customers through higher rates.

- Minimum-payment obligations or fixed-capacity charges are necessary in order to assure TVA of revenue to help meet its fixed costs in providing generating capacity to supply a power customer's demand during the term of the contract. TVA, like other power suppliers, must provide generating and transmission capacity to meet contracted demands of its customers. (In contrast to most commodities, electricity cannot be produced and stored. Facilities must be provided to instantaneously meet the demand of customers.) This requires extremely large capital outlays--as in the case of providing the system facilities adequate to supply the 4,485,000 kW of power requested for the DOE facilities. To help put this in proper perspective TVA, in order to make this amount of power available (including necessary capacity reserves), must have the equivalent of 5 large nuclear units. Projected costs for such units range from $1 to $3 billion for each unit or a total of $5 to $15 billion. Of course, the heavy investment in facilities must be committed long before the facilities are available for use.

  Fixed costs from the investment in the power supply facilities (depreciation, interest, maintenance, etc.) continue and must be paid by TVA throughout the life of the facilities, approximately 35 years. If a customer reduces or discontinues the use of power during the remaining life of the generation facilities provided to meet the customer requirements, those continuing fixed costs have to be covered by TVA to the extent the power cannot otherwise be disposed of by TVA. It is in recognition of this that the power contracts contain the various provisions allocating risks among the parties. Thus, while TVA's contracts with DOE, as well as with other large customers, do not require that any power be used, they do provide that for the term of the contract the customer will be responsible for certain minimum-payment obligations which are designed to help cover the fixed costs. (Of course, a customer when it is not using power has no obligation under the power contract to pay to TVA energy charges which recover variable types of costs such as fuel costs.) Having had the option to build its own generating facilities to supply electric power for the enrichment facilities, DOE (AEC) chose instead to purchase power under term contracts with the risks remaining with TVA after the end of the contracts. At that time, DOE will have no further payment obligation, but TVA will continue to be responsible for fixed costs incurred in preparing to supply DOE contract demands.

  The need for, and basic fairness of, such contract provisions allocating the risks among the parties were recognized long ago when congressional approval was provided for AEC to enter into contracts under which TVA would supply the very large amounts of electric power needed for the Government's expanding uranium enrichment facilities. In hearings associated with that approval, it was recognized that there would be a continuation of capacity charges under the power contracts even if there were to be a cessation in the use of power by AEC. AEC representatives explained that this allowed time for such unused power to be absorbed by the normal load growth on the

TVA system, and was appropriate and fair even though TVA might find other uses of the power while the capacity charges were continuing to be paid by AEC--since TVA, not AEC, would have the risk of covering the fixed costs following expiration of the power contract. That has certainly been demonstrated by the actual circumstances TVA is experiencing where the current DOE contracts will expire in about 7 years (and substantial contract demand reductions of over 22 percent per reduction each year will begin in less than 3 years), but the life of the generating facilities will extend for approximately 23 additional years. This has created a particularly acute situation for TVA since electric power loads on the TVA system are now projected to increase somewhere between 1/2 and 3 percent per year in contrast to the 6-8 percent annual load growths that were being projected at the time TVA entered into the current contracts to supply power for the Paducah and Oak Ridge operations.

In situations involving power supply for military installations, the Comptroller General has informed the Army and the Air Force that the legal obligation under TVA power contracts to make payments to TVA is absolute and not contingent on any budgetary problems that the agency might have. The legal propriety of minimum payment obligations in TVA power contracts has been approved by the courts. In one case, a Federal district court, in granting TVA's summary judgment on TVA's claim for unpaid minimum bills, recognized the practical necessity of such minimum-payment obligations covering contract demands for the term of the contract. The court stated:

> Because of this situation, rates chargeable by electric power suppliers to customers with large contract demands, such as Mobil's, commonly provide for minimum bill payments over specified terms of years regardless of the extent to which they actually use the power which the supplier has contracted to make available for them (Mobil Oil Corp. v. TVA, 387 F. Supp. 498, 504 (1974)).

- DOE, in an effort to reduce the amounts it pays for power made available by TVA, suggested in 1986 that TVA, in establishing rates and charges applicable for TVA power, should classify investment costs associated with generating plant as energy related, rather than demand related as has been done through the years. This suggestion was made in conjunction with TVA's consideration of certain rate changes which were subsequently approved and became effective for bills beginning in October 1986.

TVA on previous occasions has considered in detail such an approach and concluded that there is no adequate basis for such a fundamental departure from the established methodology that has been followed by electric suppliers generally. The effect of adopting DOE's suggestion would be to decrease DOE's bill by some $200 million per year. This amount would have to be absorbed by other consumers of TVA power, thus unfairly shifting to them responsibility for covering fixed investment costs incurred by TVA to make available the power requested and contracted for by DOE. Moreover, following the approach suggested by DOE would have a significant adverse effect on TVA's obtaining revenues necessary to meet its financial requirements and tests when a customer with a large load would decide to use less electricity than it had contracted for TVA to make available, as has been the case with DOE.

14. Question: Please discuss the purposes of the Waste Management Institute and the Agricultural Institute, and why it is advantageous to use the Institute mechanism?

Answer: The goal of the Waste Management Institute is to provide solutions to regional waste management problems. The Institute will go beyond current fragmented efforts and approach these issues in a comprehensive manner, addressing not only technical aspects, but fully considering the environmental, economic, and sociological impacts of engineering solutions. The institute will initially establish, coordinate, and administer three functional centers: the Hazardous Waste/Materials Training and Information

Center, the Hazardous Waste Technology Clearinghouse, and the Center for Technology Development. This framework will create an environment for training waste management professionals, environmentals, and local decisionmakers; evaluating the feasibility of new technology; and demonstrating commercially viable physical/chemical and thermal technologies for the prevention, treatment, destruction, and recovery of wastes.

Activities of the institute will complement and cooperate with efforts of the waste management center at ORNL, the UT Waste Management Research and Education Institute, Vanderbilt University, and TVA/EPA research.

The TVA Agricultural Institute conducts programs to increase farm income, promote agribusiness and rural economic development, and protect soil and water resources. Current emphasis is on introducing alternative enterprises, such as fruits, vegetables, and ornamentals. The institute is also promoting the development of rural business and cooperatives to provide high-value markets for farmers and to create jobs in rural areas. Intensive efforts are conducted to reduce soil erosion and improve water quality while enhancing farm income. New technology is being tested and introduced to help increase farm production efficiency and farm management. These activities are conducted in partnership with the land-grant university extension services, USDA agencies, State and local organizations, and farmers. Many of the joint activities are serving as national models of multiagency cooperation.

The institute mechanism for conducting these programs offers two significant advantages over traditional organizational structures. First, the institute concept increases the administrative efficiency in planning and conducting programs within TVA. Multidisciplinary staff from all offices in TVA would be assigned to the institutes on a short-term, case-by-case basis to lend their expertise to issues under consideration and to coordinate appropriate use of program resources.

Second, the institute concept provides identity outside TVA. Significant activities will be conducted to attract staff and resources of other organizations in jointly addressing waste management and agriculture and in sharing achievements with organizations across the Nation.

15. Question: Please provide an update on the two issues included in the Inspector General's semiannual report - Review of the TVA Retirement System and Delay in Transfer of TVA's Annual Financial Audit to the OIG.

Answer: Review of the TVA Retirement System (TVARS)

On November 4, 1986, the Inspector General (IG) and the TVARS Board discussed an OIG audit of the TVARS. On November 6, 1986, the IG followed up with a memo to the TVARS Board proposing a financial and compliance audit of TVARS in accordance with Chapters I through V of the Standards for Audit of Governmental Organizations, Programs, Activities and Functions.

The TVARS Board informed the Inspector General and the TVA Board of its position with respect to the proposed audit. By memorandum dated January 29, 1987, to the IG, the TVARS Board reiterated their position reported in the last semiannual IG report. The TVARS Board insists that the OIG scope and procedures be limited to those performed in prior years by the Office of Audit & Evaluation. The Inspector General did not agree and is continuing the postponement of the audit until all impairments are lifted. The Inspector General believes, based on auditing standards, that the auditor must be free to apply whatever procedures are necessary in the circumstances without hindrance by the auditee. The Inspector General has informed the TVA Board of Directors of the TVARS Board's unchanged position. The TVA Board of Directors in obtaining legal advice on this matter.

Delay in transfer of TVA's Annual Financial Audit to the OIG

TVA's General Manager and the Inspector General have agreed on the transfer of the responsibility to the Inspector General for administering the contract for the annual financial audit of TVA. Effective fiscal year 1987 the Inspector General will administer the audit contract. Fiscal year 1987 is a transition year; therefore, the Inspector General will continue with the same firm performing the fiscal year 1986 audit. Other firms will be allowed to compete for future audits. The Inspector General is in the process of negotiating a contract with the firm.

16. Question: The Tennessee Valley region experienced major drought conditions this past year. I understand that rainfall this winter has been above normal. Is TVA projecting normal lake levels for 1987? Do you consider the drought to be over? Are there continuing problems carried over from last year that you will have to address in 1987 and 1988?

Answer: After a record-setting 26-month drought, the pattern of rainfall across the Tennessee Valley returned more nearly to normal late in 1986. Monthly rainfall amounts have been at or above normal for five of the last six months. Although total rainfall for the period was only 3-1/2 inches above average, the change in the weather pattern is a welcome indication that normal conditions have returned and that the extended drought has been broken. The recent rains have not only increased streamflows throughout the region, but have improved runoff conditions to the point where median summer reservoir levels can reasonably be expected if the normal rainfall pattern persists during the spring and early summer months.

Water shortages during the drought led to water quality problems in many TVA reservoirs, causing increased retention times and elevated water temperatures. Because Kentucky reservoir appeared to have experienced the most serious problems during this period, TVA has organized an interagency task force that includes State and Federal agencies and public interests to diagnose the problems and recommend corrective actions. The work of this committee will likely extend beyond 1988. Because long-term effects of the drought may yet adversely affect other reservoirs, continued monitoring of the region's water resources is essential.

17. Question: With the recent increase in rainfall in the Tennessee Valley, does TVA expect normal hydroelectric generation in fiscal year 1987?

Answer: The near normal rainfall that occurred through February has resulted in hydroelectric power production that is just above the average amount expected for the first five months of the fiscal year. A normal total of 18.4 billion kilowatthours is projected for the fiscal year, based on a continuation of the rainfall and runoff pattern experienced since September 1986.

18. Question: Past runoff from heavy rains has at times resulted in flooding of farmland adjacent to mainstream reservoirs. Should above average rainfall continue, what impacts can we expect to find on reservoirs and tributary streams this year?

Answer: Heavy rains in the Tennessee Valley in late November and late February resulted in discharges from some mainstream dams that flooded adjacent, low farmland. This type of flood is not uncommon and normally occurs during the winter months with minimal agricultural flood damages. However, exceptions, such as the May 1983 and May 1984 floods have occurred, resulting in extensive agricultural damage. Normal or slightly above normal rainfall should not cause any serious impacts on the agricultural industry in the Valley. Extreme individual storm events that produce rainfall amounts of 2 to 3 inches or more over a 2- to 3-day period can interrupt normal agricultural activities and result in significant damage. This would depend on the time of year, runoff conditions, soil moisture, and upstream reservoir levels. Every effort is made, within normal operating constraints, to operate the reservoir system to minimize agricultural flood damage. However, land near TVA reservoirs is always subject to greater risks of inundation during heavy rainfall. Heavy rainfall also may flood some naturally low-lying areas along tributaries and near reservoirs, regardless of TVA flood control operations.

## QUESTIONS SUBMITTED BY SENATOR STENNIS

1. Question: While I am very interested in all of the programs of the Tennessee Valley Authority, I am particularly concerned about the future of the economic development program. In 1980, $14.7 million was appropriated for TVA's economic development programs; this year the figure is $11.7 million. I understand that in order to operate at the 1980 level, an appropriation of $21 million for economic development would be required for fiscal year 1988. How much is in the President's budget for TVA's economic development program?

Answer: There are no funds in the fiscal year 1988 President's budget for TVA's economic development program.

2. Question: The Tennessee Valley Authority has been involved in over 50 economic and community development programs in Mississippi during the past year. Please give some examples of the kind of activities that are conducted in this program in the Tennessee Valley area.

Answer: The economic problems facing the rural Tennessee Valley are varied and complex. Solutions must recognize the interrelationships between those problems. Job creation is critically dependent upon strong community leadership. Both are tied to an appreciation for and wise use of available natural resources. Finally, educational parity for rural residents is an absolute necessity if our citizens are to acquire the skills required for tomorrow's jobs.

TVA activities are built around this integrated approach increasing the payoff beyond that possible from a scattering of single-purpose projects. Last year, using this approach, TVA helped create more than 20,000 manufacturing and business jobs and provided skills and basic education improvements for nearly 20,000 Valley citizens. But the potential, both in the region and in transferring innovative, pioneering methods beyond its borders, is far greater.

A few selected examples of TVA's economic development activities in the Tennessee Valley region are:

- In Campbell County, Tennessee, TVA helped Camel Manufacturing, Inc., expand its product lines to create 150 new jobs. Assistance provided to the firm through the existing industries program included industrial engineering assessments, energy management surveys, electrical service development, and employee training reimbursement for 35 employees taken off local unemployment rolls. Overall, in fiscal year 1986, this program helped create a total of 10,200 new jobs through existing industry expansions in the region.

- TVA efforts in Starkville, Mississippi, are an excellent example of our commitment to comprehensive economic development for Valley communities. In a county where 30 percent of the residents live in poverty and the per capita income is only 59 percent of the national average, the TVA special opportunities counties and cities program has undertaken a comprehensive program of downtown renovation and industrial development. As part of ths downtown redevelopment effort, the historic Starkville Hotel was renovated into a luxury facility with retail outlets, a restaurant, and an auditorium. A total of 60 new jobs were created, and it is the prime anchor in the downtown area. Recently the city used additional TVA assistance in helping Hewlett Wood Products to add a new product line, creating 40 new jobs. Overall, in fiscal year 1986 this program created a total of 1,800 jobs in the region's least-developed areas.

- In Paducah, Kentucky, TVA helped Bert-Well Industries, Inc., undertake a major plant expansion which created 100 new jobs. Through the existing industries program, a comprehensive energy management survey and on-the-job training assistance were provided to the firm, which produces truck interiors.

- In Chattanooga, Tennessee, TVA has established an automated "Factory of the Future" training center on the campus of Chattanooga State Technical Community College. Valley industries use the center to train workers, displaced workers are retrained for new jobs, short courses are provided for high school and technical school faculty, and over 300 students have received associate degrees in advanced manufacturing technology. The Factory of the Future serves as a model for automated manufacturing training throughout the Nation. Overall, in fiscal year 1986 the TVA skills and education program provided training of many different kinds to nearly 20,000 Valley residents.

- TVA's Agricultural Institute has helped develop eight new fruit and vegetable marketing cooperatives in the region. These co-ops have created 9 full-time and 275 seasonal jobs, and more importantly generated more than $4.5 million in sales in fiscal year 1986. The co-ops help family farmers in the region dramatically increase their farm income, which is critical to preserve the region's rural life-style.

- In Ft. Payne, Alabama, local leaders are revitalizing their commercial business sector. TVA has helped by providing a detailed market study of development potential, training programs for small business persons and prospective entrepreneurs, franchising workshops, location studies, and commercial business promotional suggestions. Several new businesses have opened as a result of this work, and a local entrepreneur recently announced plans to develop a new shopping center to further capitalize on identified commercial business opportunities. TVA's new commercial business development program has helped create over 400 new service sector jobs in 10 communities since its inception in fiscal year 1986.

- In 1986 TVA helped establish a new mountain crafts industry in Hancock County, Tennessee. The firm uses locally grown corn products, herbs, and wildflowers in making products for the growing craft industry. The project grew from a home craft operation to a full-time business. The expansion to an industrial building added 30 employees and provided part-time work for 8 others. This project, in one of the Nation's poorest counties, is a good example of using indigenous resources for job creation through TVA's special opportunities counties and cities program.

- In Tupelo, Mississippi, TVA is involved in an innovative literacy and skills training demonstration. Several dozen illiterate adults will be taught to read, assisted in obtaining high school diplomas, then trained in specific skills and placed in jobs in northeast Mississippi. This project, which is being conducted in cooperation with IBM and Itawamba Junior College, is being closely monitored by educators across the Nation.

- The special opportunities counties and cities program provided assistance which was instrumental in encouraging the location of the Outboard Marine Corporation in Yancey County, North Carolina. The local economic development commission used TVA assistance in purchasing and preparing 53 acres for the OMC plant. The firm has provided 300 new jobs in an area where one quarter of the residents live in poverty.

- TVA's Agricultural Institute is introducing technology to increase swine production in Mississippi and parts of Alabama and west Tennessee. A substantial meat-packaging industry in Mississippi currently is having to import the majority of its swine production. TVA efforts have the potential to increase family farm incomes substantially by developing local production for this significant existing market.

- In Sheffield, Alabama, TVA helped U.S. Die Casting and Development Company add over 100 new jobs by providing market research assistance, a comprehensive energy audit, wastewater treatment advice, and employee training assistance. TVA has marshalled the entire agency's resources under its existing industries program as a major commitment to the region's manufacturers.

3. Question: What will happen to these activities if the President's budget for TVA's economic development programs is adopted?

Answer: Unfortunately, all of our economic development efforts would have to be discontinued. The impact on the region of this elimination would be far greater than the $13.8 million we requested for our economic development programs. While TVA does not singlehandedly stimulate new economic activity in the region, we frequently serve as the catalyst that enables economic improvement to occur. The assistance we provide normally leverages many times its amount in other public and private investment. This is accomplished by helping communities identify their greatest potential for job creation and economic improvement.

The elimination of TVA economic development programs would result in the loss of thousands of job opportunities throughout the region--from new industry, from expansions of existing industry, from new technology-related ventures, and from tourism and commercial business opportunities. It would also stop TVA's efforts to help provide literacy training, adult education, industry-specific training, and high-technology skills training to thousands of Valley residents each year. Finally, the elimination of TVA economic development programs would put an end to our efforts to develop and test practical solutions to the Nation's significant rural development problems.

4. Question: The problems of rural America have reached crisis proportions in recent years. What capabilities do TVA have to address these critical rural development programs?

Answer: TVA is uniquely qualified to undertake a rural economic development initiative of national importance. First and foremost, TVA has the experience from many years of rural involvement. TVA has lived and worked with the people of the Tennessee Valley region for over 50 years, helping introduce electricity, desperately needed resource conservation techniques, and economic improvements to a rural population which was almost totally isolated in the 1930s. TVA has been here during the evolution of State and local governments and their development agencies, and we have formed the working partnerships necessary to undertake this new challenge. In addition, we have working relationships (cooperative projects with land-grant and other universities) in place in about 35 States outside the Tennessee Valley to work on rural development problems.

Second, TVA has contemporary and diversified expertise. We have expertise in engineering, economics, science, education, and planning which allows us to conduct a broad range of efforts directed to rural areas. In addition, we have over the past two years piloted some new approaches to rural job creation which have proven successful and are ready for broader application. Among these new tools are efforts to stimulate the service sector of rural areas, leadership development programs, literacy and basic educational improvement efforts, and sophisticated multicounty marketing techniques.

We are also participating in several national agricultural development projects that center around fertility for alternative crops--a consideration which often stimulates local industries. With some redirection of this part of our programs, a limited amount of additional work could be done in this area and in fitting local industries more fully into rural communities.

Finally, throughout its history TVA has advocated and pursued unified resource development efforts. Problems facing rural areas nationally are difficult and complex; single-purpose approaches will no longer suffice. TVA has proven its ability to blend its unique range of expertise to tailor solutions to particular problems. We believe the development of this type of capability on a national basis is critical in addressing the future of rural America.

5. Question: How much would it cost of TVA to initiate a rural development demonstration in the Tennessee Valley which would apply to rural areas throughout the Nation?

Answer: As we have emphasized before, these problems are great and no short-term solution exists. In order to launch a full-scale assault on the rural problems in the Tennessee Valley region, TVA would need to invest an additional $10 to $12 million annually for as long as 10 years. We are aware, however, of the current constraints on the Federal budget. Based on these realities, $5 million above the current level would be adequate in fiscal year 1988 to begin this important initiative. We believe that with these startup funds we could help create an additional 3,000 new job opportunities and educate and train an additional 3,500 individuals, lay the groundwork for even more impressive results in future years, and demonstrate an effective model of dealing creatively with the problems of rural America which could be applied in other rural areas throughout the Nation.

## APPALACHIAN REGIONAL COMMISSION

### STATEMENT OF WINIFRED A. PIZZANO, FEDERAL COCHAIRMAN

**ACCOMPANIED BY:**
**FRANCIS MORAVITZ, EXECUTIVE DIRECTOR**
**DAVID MEUSER, BUDGET OFFICER**

### INTRODUCTORY REMARKS

Senator SASSER. Our next witness this morning will be Ms. Winifred A. Pizzano, the federal cochairman of the Appalachian Regional Commission, who will present testimony on the ARC programs.

Ms. Pizzano, would you be kind enough to introduce your colleagues for the record and then proceed?

Ms. PIZZANO. Mr. Chairman, I have with me Dr. David Meuser, who is the budget officer for the federal office of the Appalachian Regional Commission and Mr. Fran Moravitz, who is the executive director of the Appalachian Commission.

Senator Stennis and Senator Sasser, I am very happy to appear before this committee and to have the opportunity to talk with you about the programs of the of the Appalachian Regional Commission. I am here to support the administration's position which has been a request for zero funding for Appalachian Regional Commission over the past several years.

We take that position for two reasons. First, that the problems that remain in the Appalachian region have been caused now by forces beyond ARC's control and can't be solved by programs like the ARC. They are related to the strength of the dollar, the trade imbalance and structural changes in the economy of rural America.

There is also another question of fundamental fairness, which goes to the fact that rural areas across the country have problems similar to the ones of Appalachia, and it is a question as to whether funds should be targeted directly to this particular geographical area.

However, I am very cognizant of my stewardship responsibilities. I am aware that there is strong support for the Commission in the Congress and that there is some probability that we will again be funded, in which case, I will continue to spend the monies expeditiously and as prudently as possible.

### PROBLEMS IN RURAL AMERICA

If I may take a second, though, I'd like to talk about the rural problem in the United States, which we don't regard as necessarily a farm problem. As you know, agriculture is less dominant in Appalachia than in other rural areas; although even nationally, only 700 of the

3,134 counties are primarily agricultural. Essentially, we are dealing in the rural areas with a three-legged economy, from an employment standpoint that is: Agriculture, of course, manufacturing, and mining.

All three of these sectors are undergoing a structural realignment during the eighties and nineties, and while we will gain back many of the jobs we lost in Appalachia and in other parts of rural America in the early eighties, there are some of them that are just going to stay lost.

I don't think we should allow that reality, however, to be obscured by steadily improving unemployment figures, which in Appalachia, although still too high in many areas, is dropping faster than the nation as a whole.

Rural America looks economically very different from urban America. There is higher persistent unemployment; there is less diversity in the economy; and there are very few economies of scale available to governments in rural areas.

In Appalachia, however, we generally talk about three broad groups of counties within our overall area. There are some that are characterized by not only severe, but persistently severe, economic distress. That is, 88 out of some 400 counties, 20 percent of our counties, have been continually and persistently distressed.

There is a somewhat smaller group at the upper end of the spectrum where the local economy is performing on a par with or better than the national average. Then there is another group, the vast majority of our counties, where the economic news is mixed. For example, 25 percent of these counties have employment levels that are at or above the national average, but do not meet any of the other criteria for economic strength.

So it is these counties, then, that we think benefit most from efforts to diversify and broaden their local development base. I think the rural areas should worry less about reclaiming lost jobs and focus more on generating their fair share of the new ones to come over the next few years.

## HUMAN NEEDS VERSUS STRUCTURAL NEEDS

One thing we do know for sure is that most of the jobs being created require more education and more skills than the jobs that have been lost. This would suggest a shift in economic development strategies, if not away from physical infrastructure in favor of a more human infrastructure programs, then at least toward a greater balance between the two. Ouality and flexibility of an area's work force will be a more important factor than ever before in determining the potential for future stability and growth in rural areas.

The National Governors' Association has recognized this, certainly, as well as the Southern Growth Policies Board, which represents eight of our Governors on the Appalachian Commission, and they are starting to take the lead in the area.

In response, ARC, in our only quorum meeting of the year, approved last month the first major program changes at ARC in more than 5 years.

We established a new category of projects in the area of human infrastructure, for which ARC's match will be increased to 80 percent. We judged incentives to be better than requirements. We expect that these new human infrastructure programs will be in education, technology transfer, and entrepreneurial development, among others.

There are some changes in the distressed counties program; we have adjusted the criteria and the number of counties involved in the distressed county program. There are more now than there were in the past.

At the other end of the spectrum we have recognized that there are some counties in Appalachia that are economically competitive, and we have responded to this fact, as well as to instructions from this committee to take a look at our match by dropping ARC's matching fund level to 30 percent for traditional infrastructure projects in these communities that are better able to finance them.

We have also given the states greater flexibility to respond to changing events by permitting Governors to transfer up to 10 percent of their ARC highway funds, or $500,000, whichever is greater, to economic development programs.

At that same meeting, we approved a new highway cost study to be completed by October 1987, when we will have a better idea of how much it will cost to fund the rest of the Appalachian highway system.

### PREPARED STATEMENT

I have submitted a prepared statement, Mr. Chairman, which details many of our accomplishments and work over the past several years. I bring to your attention three pieces of research: Some work we did in small business; some work we are doing on the capacity of the region to compete; and some work on hospital survivability.

I encourage you to take a closer look at rural development issues and their solutions, and I remain here to answer any questions you may have.

[The statement and research articles follow:]

## STATEMENT OF WINIFRED A. PIZZANO, FEDERAL COCHAIRMAN, APPALACHIAN REGIONAL COMMISSION

Thank you very much, Mr. Chairman.

I appreciate the opportunity to testify before you today in support of the Administration's budget request, and on other matters.

As you know, the Administration has once again proposed termination of the Commission -- both its highway and nonhighway programs -- at the end of Fiscal Year 1987. Accordingly, no funds for ARC in Fiscal Year 1988 have been included in the President's budget.

Mr. Chairman, I continue to support the Administration's proposal to terminate the Appalachian Regional Commission for the following reasons.

First, I believe that the ARC has, in large measure, accomplished its original mission. The original goal was to help create in Appalachia a capacity to compete successfully with the rest of the country. In so doing, it was hoped that federal investment in development activities would act to reduce the Region's drag on the overall American economy, while at the same time helping to improve the quality of life for some 20 million Appalachian citizens.

No one in the Administration would suggest that poverty has been completely eliminated in Appalachia, any more than we would suggest it has been completely eliminated anywhere else in the United States. Nonetheless, today residents of Appalachia are far healthier, better educated, more highly skilled, and wealthier than they were when the Commission was created in 1965.

Back then, the contrast between all or most of the Region and the rest of the country was dramatic. Today, that's no longer true. Twenty-two years ago, I believe there was widespread agreement that the nation should endeavor to narrow the gap -- socially, economically, and geographically -- between Appalachia and the rest of America.

To a great extent, we have done that. The roughly $5 billion dollars in federal funds spent by ARC during that period has not only underwritten a vast inventory of physical infrastructure, but has aided the establishment of basic social services in countless places that previously lacked such services.

The gap may not be closed in every corner of Appalachia, but it has been narrowed significantly across our Region as a whole.

Which brings me to my second reason for supporting the Administration's proposal to terminate ARC, namely, fundamental fairness. In a time when substantial spending cuts are an absolute necessity, people often disagree about which specific programs to cut. At the same time, they all agree that budgetary belt-tightening must be fair -- and that shared goals should be achieved through shared sacrifice.

If I lived in a distressed area of a state outside the Appalachian Region, I would find it unfair in the extreme to see my federal tax dollars -- and those of people living in other distressed areas all over the nation -- being funnelled into a program from which my country was ineligible to receive any funds.

It is our view that the most serious economic problems remaining in the Region have been caused for the most part by forces beyond ARC's control -- and cannot be effectively addressed by ARC's traditional economic development tools: bricks and mortar infrastructure projects designed to support "smokestack chasing."

Moreover, the rural economy is now such an integrated part of the national and global economy that traditional sector-specific and community-specific policies are insufficient to deal with the problem.

I am firmly convinced that we cannot build rural prosperity by propping up certain sectors of the economy, or individual firms -- in an effort to protect them from the realities of a highly competitive world.

In Appalachia, that competitive challenge is being faced largely by rural counties. Although it's an uphill fight, it's one being fought on a fairly well-defined battlefield.

In rural areas, from an employment standpoint, you're looking at a three-legged economic base: agriculture, mining, and low-skilled manufacturing. Each of these industrial sectors is undergoing a major realignment in the 1980's. One end result of these shifts is likely to be reduced future employment in all three sectors. The bottom line is that many of the jobs lost in rural America in recent years are likely to stay lost.

The good news, however -- and there really is good news -- is that there is every reason in the world to believe that rural areas can claim their full share of the new jobs being created as America moves into a whole new economic era.

Rural areas can claim those new jobs, that is, if they are willing to recognize the changes taking shape in our new global economy, and if they are able to marshall the resources needed to reshape their workforces to respond to those changes.

Such an effort, however, will require a real shift in thinking by those involved in economic development at every level: local, state, and federal.

For years, when local officials talked about economic development, they were almost by definition talking about building physical infrastructure. If anything will have to change in the emerging rural economy of the 80's and 90's, it's that one-dimensional attitude toward economic development.

I don't want to leave an incorrect impresion here: adequate physical infrastructure will always be an important element in economic development --but, increasingly, physical infrastructure alone will be insufficient to spur a rural area's long-term stability and growth.

But, programs and policies designed to strengthen rural America's "human infrastructure" -- its workers -- must be central to any successful effort to revitalize rural economies.

For a variety of reasons, the transition from farming, mining, and low-skilled manufacturing employment will not be easy for many displaced workers. Nevertheless, positive steps can and must be taken not only to ease -- but to encourage -- that transition as soon as possible.

First, rural communities must place a higher priority on keeping students in school and improving the quality of the education they receive. At the same time, increased emphasis must be given to adult literacy, job training, and entrepreneurial development programs.

These efforts -- when successful -- will act to spur economic development by increasing not only the range of employment options for individual workers, but the overall flexibility of any area's entire workforce.

The jobs lost in Appalachia in recent years have typically required lower education and skill levels than the jobs our economy is creating. Areas -- rural areas in particular -- that recognize this shift, and respond to it, will be strengthening their own foundations for future economic stability and growth.

To a great extent, it was the Commission's commitment to support and encourage that kind of flexible commitment that prompted our recent approval of the first significant changes in ARC's program policies in more than five years.

On February 22, 1987 the Appalachian governors and I agreed unanimously to take the following actions:

First, we established a new category of projects primarily in the area of "human infrastructure" for which the ARC will match state and local contributions on an 80/20 basis. Rather than simply require the states to put more emphasis in these areas, we opted instead to leave such decisions to them -- while making it more attractive to strike a greater balance between physical and human infrastructure.

Among others, we anticipated funding projects in areas such as high school dropout reduction, adult literacy, job training, technology transfer, and entrepreneurial development through this new program.

Second, we have made some changes in the Commission's Distressed Counties program. Our designation criteria have been adjusted, with the result that several more counties will become eligible for Distressed County funds.

On the other end of the spectrum, we have created a new category of counties which we're calling Economically Competitive Counties. This action was taken in response to instruction by this Committee in each of the past two years to explore options for reducing the ARC's share of certain projects from 50/50 to 30/70.

Economically Competitive Counties, designated by the states using our criteria, will be those that have made real progress economically relative to the rest of the country. In these counties, we would hope ARC dollars would be used primarily for "human infrastructure" projects -- and for other projects which appear likely to have a positive "ripple effect" in surrounding, less competitive counties.

From now on, if traditional, bricks and mortar infrastructure projects are submitted from these counties, ARC will fund them on no more than a 30/70 basis. And we'll be tougher than in the past in defining the local match. I would remind the distinguished Members of the Committee that this somewhat historic change was approved unanimously by the eleven Appalachian governors who attended our recent meeting.

The last major change we made involves the highway program, and is consistent with our goal of providing some degree of flexibility to the states. Under our newly revised Code, Governors will be permitted to shift up to 10 percent or $500,000 of their annual ARC highway allocation (whichever is greater) to their ARC non-highway programs each year.

We have made this change in recognition of the reality that neither opportunities nor crises can always be foreseen. By placing this modest "transferability" provision into the ARC Code, we are giving states more flexibility to respond to changing circumstances.

Finally, at our recent meeting, the Governors and I approved a Regionwide cost study of the Appalachian Development Highway System to be conducted in cooperation with the Department of Transportation and the state highway agencies. This study will be conducted in accord with usual Federal Highway Administration procedures and criteria. We expect the study to be completed by October 1, 1987 and will share its findings with the Committee at that time.

During 1986, ARC commissioned two studies that may be of particular interest to the Committee.

The first, known as the 1986 Pennsylvania New Firms Survey, was conducted by Mr. Paul Reynold and Mr. Steve Freeman of the Snyder Entrepreneurial Center at the University of Pennsylvania's Wharton School of Business.

The current economic problems being experienced in rural America, and a body of recent research indicating that new firm births and small firm growth are a major source of new jobs, have greatly increased interest in rural entrepreneurship. After all, smaller firms predominate in rural areas. State, regional and federal agencies are now considering programs and policies to enhance new firm growth and, in turn, contribute to the economic development of rural areas.

Research by others has repeatedly demonstrated the significance of new firms as a source of new jobs, but there has been very little research on the actual processes involved in the initiation, development, and survival of new firms. A statewide, all-industry pilot study conducted in Minnesota in 1984 indicated that it was possible to develop reliable descriptions and analyses of new firms, their development, and their contributions.

To build on the success of the Minnesota project, ARC and the Commonwealth of Pennsylvania commissioned a survey designed to describe the birth, development and contributions (in jobs, sales, and exports) of new Pennsylvania firms.

Highlights of the study's findings include:

- Between 23,000 and 50,000 new firms established in Pennsylvania between 1979 and 1984 were still in business in 1986.
- These new firms contributed between 7-15 percent of all 1985 Pennsylvania jobs, and 5-10 percent of all 1985 Pennsylvania personal income.
- Retail and consumer service new firms were the major source of half the new jobs and forty percent of the new sales.
- Manufacturing, distributive service (wholesale), and business service new firms were the major sources of eighty percent of new out-of-state domestic exports; foreign exports were almost nil.
- New firms are started by people that live in the area. There is absolutely no indication that people moved to Pennsylvania to start new firms.
- The infrastructure features considered most important to new firms were "access" (to customers, suppliers, capital) followed by suitable labor and operating conditions.
- In general, there is a high level of satisfaction with infrastructure features. Satisfaction is higher with features considered more important.

  One exception would be "taxes and regulations." Considered of high importance by the firms surveyed, it is associated with the lowest level of satisfaction.
- New firms that had used any of the economic development program services funded by the state and federal governments showed greater interest in all such services than firms that had not taken advantage of any such programs.

The Pennsylvania New Firms Survey confirmed that new businesses can contribute much to a state's economy, and that increased attention to the problems and needs of new firms can enhance the value of those contributions.

The second study I would like to touch on briefly was conducted by SRI, International. SRI has done a number of studies in recent years focusing on the relative competitiveness of both regional and state economies.

They have taken a leading role in identifying and analyzing the need for what SRI calls the "new infrastructure." Their view is that in addition to traditional, physical infrastructure, the evolution of the economy has created new requirements areas must satisfy in order to remain competitive for jobs and income.

The components of this "new infrastructure", as defined by SRI, include: availability of capital; access to technology; a skilled, adaptable workforce; and, resident entrepreneurial ability.

SRI's study for ARC focused on the experiences of Appalachian firms in six key industries in satisfying their needs for new infrastructure. The study also examined the strengths and weaknesses of the institutions that supply the new infrastructure in each Appalachian state.

The industries studied were: auto supply, apparel and textiles, chemicals, tourism, instruments, and telecommunications equipment.

SRI concluded that Appalachia has met much of its need for physical infrastructure, and that while continuing those efforts, it must step up efforts to create "new infrastructure." Its final report, not yet complete, will discuss the competitiveness of Appalachia's new infrastructure programs from both near-term and long-term perspectives.

In the near-term, SRI concludes that the region has a broad range of programs that assist in providing access to technology and recommends that the region build on this strength.

Similarly, they find that Appalachia has a well-developed system of two-year post-secondary institutions that can become even greater focal points for training the new types of workers industry increasingly requires.

On the other hand, SRI finds that institutions and programs designed to increase the availability of capital are inadequate. They urge more aggressive efforts to bring borrowers and lenders together, and urge the use of public funds to leverage greater private participation.

From the long-term perspective, SRI concludes that Appalachia's new infrastructure base is less well developed than in other parts of the country. They recommend focusing on a realistic strategy to increase the region's competitiveness through multi-state as well as state-by-state efforts.

They urge that emphasis be given to programs designed to insure that existing industries have access to technological developments in the U.S. and abroad.

SRI recommends that basic education reforms now underway be given higher priority, sustained over the long-term, and be extended to all levels of the educational system.

Finally, the authors of the study conclude that insufficient capital is likely to be made available to firms if primary reliance is placed on public sources -- unless those public funds are used to leverage additional private funds, and unless regulatory and other changes affecting private capital sources are made.

Mr. Chairman, both the Wharton study and the SRI study provide information which underscores the need for all those concerned about economic development -- especially in rural areas -- to challenge the assumptions on which many existing programs are based.

If new firms create jobs, and people who start new firms tend to do so where they already live, then perhaps less emphasis should be given to industrial recruitment campaigns.

Similarly, if the types of jobs likely to be needed in the years ahead will be created by firms requiring a better educated, more flexible workforce, then perhaps measures designed to achieve that objective should be near the top of any federal, state, or local economic development action plan.

In addition to the activities I have outlined so far, Mr. Chairman, the Commission continued during the past year to make progress on a number of activities outlined in the Finish-up program presented to Congress by the Appalachian governors in 1982. A brief summary of those activities would include:

## Distress Counties

Under the area development program, we have directed a significant share of ARC area development resources to the most severely distressed counties in the Region. As you know, Mr. Chairman, these counties qualified for relatively few ARC dollars over the years because those dollars were directed by law to areas with the greatest growth opportunities, and the Distressed Counties had few such opportunities.

These 76 counties targeted under the Finish-up program have received nearly $53.4 million of ARC assistance during the past 4 years, representing more than 27% of ARC's area development funds available during that period.

This amounts to more than $38 million for projects to improve water, sewer, and waste treatment facilities, which has long been a basic need in these areas. Other aid included $7.9 million for 44 job-creating type projects and some $9 million for various health, housing, and access road projects. More than $500,000 was spent to support dropout prevention programs in 21 distressed counties.

## Jobs and Private Investment

The Committee may be interested to know that the narrow focus of ARC's other area development funds under our Jobs and Private Investment Program has resulted in more effective use of ARC dollars.

During 1983-86, the 267 infrastructure projects funded by ARC with a total of $91.5 million helped attract nearly $1.2 billion in private investment -- and are projected, on completion, to have created or retained some 63,000 jobs in the Region.

## Highways

Finally, with regard to our highway program during the years 1983 through 1986, $395.2 milliion was obligated. $374.6 million of that sum was spent on the Appalachian corridor system, and the remaining $20.3 million on access roads. During this period, 237.4 miles of corridor highways have been completed; we placed under construction 144.7 miles; acquired right-of-way for an additional 99.7 miles; funded engineering and design for still another 118.4 miles; and, finally, placed 116 miles of access roads under construction.

Mr. Chairman, let me reiterate that I fully support the Administration's position with respect to the future of the ARC. At the same time, I am well aware that the Congress has not agreed with the President's recommendations in this regard in the past. I wish to assure the Committee that in the event that Congress again appropriates funds for the Commission, I will continue to insure that those funds are expended as prudently and effectively as possible.

Thank you.

# 1986 PENNSYLVANIA NEW FIRM SURVEY

## Volume One

## Executive Summary

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### A. Introduction

The apparent intractability of rural economic decline and recent research indicating that new firm births and small firm growth are a major source of new jobs have increased interest in rural entrepreneurship. After all, smaller firms predominate in rural areas. State, regional, and federal agencies are now considering programs and policies to enhance new firm growth and, in turn, contribute to the economic development of rural areas.

Several research endeavors have demonstrated the significance of new firms as a source of new jobs, but there has been very little research on the actual processes involved in the initiation, development, and survival of new firms. A state-wide, all industry pilot study completed in Minnesota in 1984 indicated that it was possible to develop reliable descriptions and analyses of new firms, their development, and their contributions.

The success of this project and the exploration for further program development led the Commonwealth of Pennsylvania and the Appalachian Regional Commission to initiate a survey of new Pennsylvania firms. The study was to provide a description of the birth, development, and contributions (jobs, sales, and exports) of new Pennsylvania firms. A small group of new firms that had received services through the Appalachian Regional Commission-supported Pennsylvania Enterprise Development Initiative were also included.

These new firms were to be compared with typical new firms in Pennsylvania's Appalachia.

Data collection from a representative sample started with a random selection of firms from the October 1985 Dun (and Bradstreet) Market Identifier file; one-sixth were to have started business in each of the years 1979 through 1984. Firms were screened by phone to determine actual start date, current ownership, and viability. Almost 50% did not meet the criteria. For those eligible new firms, a member of the startup team currently active in firm management was sent a 16 page mail questionnaire. If not returned after three requests, the respondents were interviewed by phone. The response rate was 67%.

The 1,534 new firms in the sample represent all industry sectors and uniform planning regions of Pennsylvania. The source of the sample, the procedure, the response rate, and comparisons with other data sources gives high confidence that the sample represents the population of new firms in Pennsylvania.

## B. Results

- Between 23,000 and 50,000 new firms established in Pennsylvania between 1979 and 1984 were still in business in 1986.
- These new firms contributed between 7-15% of all 1985 Pennsylvania jobs and 5-10% of all 1985 Pennsylvania personal income.
- Retail and consumer service new firms were the major source of half the new jobs and forty percent of the new sales.
- Manufacturing, distributive service (wholesale), and business service new firms were the major sources of eighty percent of new out-of-state domestic exports; foreign exports were almost nil.
- Over half the new firms and more than half of the contributions (jobs, sales, and exports) occurred in the Delaware Valley (Philadelphia) and Southwest (Pittsburgh) regions. The Capital region (Harrisburg-Lancaster) was the major location for contributions among the other eight regions.
- Variation among individual new firms was substantial: from none to over 250 jobs were provided (average of 12.8); from none to over

$20 million in sales (average of $698,000); from none to over $15 milliion in exports (average of $126,000).

- Aggregate contributions of new firms reflect two factors: the number of new firms initiated and the average size of new firms.
- For the ten regions of Pennsylvania, birth rates of new firms in export potential industries (manufacturing, distributive service, and business services) were unrelated to the birth rates of new firms in local market industries (retail, construction, and consumer service).
- For the ten regions of Pennsylvania, higher birth rates of new firms in export potential industries were associated with higher percentages of well educated adults; higher percentages of mid-life adults (25-44 years old); and a low unemployment rate.
- For the ten regions of Pennsylvania, higher birth rates of new firms in local market industries were associated with a higher unemployment rate.

Two strategies were used to predict the relative contributions of new firms.

- The first assumed that all new firms were equal in their potential for contributions. It involved attention to a number of variables (137, reduced to 24) considered useful for predicting variations in jobs and sales provided by new firms. While the capacity to predict variation in jobs and sales was quite high (explained variance was 64% for 1986 jobs and 72% for 1985 sales), the number of variables was large and few seemed obvious candidates for public policy intervention.
- The second strategy was to classify new firms in terms of critical characteristics such as growth patterns. The average high-growth new firm (average annual sales growth in excess of $100,000) had three times the jobs and ten times the sales of the average low-growth new firm.
- One-fourth of new firms were high-growth, they contributed two-thirds of all new firm jobs and eighty percent of all new firm sales and out-of-state exports.

- Low-growth new firms (average annual sales growth less than $100,000) dominated all industry sectors. High-growth new firms were more predominant in manufacturing, distributive services, business services, and construction.

- New firms that exported over half their sales or over $100,000 a year were considered export oriented. Two-thirds of the high growth new firms were also export oriented.

- One in five new firms was export oriented; they accounted for one-third of all new jobs, almost one-half of all new sales, and over 90% of all new out-of-state exports.

Major findings related to the contexts in which new firms operate include:

- New firms are started by people that live in the area. There is absolutely no indication that people have moved to Pennsylvania to start new firms.

- The infrastructure features considered most important to new firms were "access" (to customers, suppliers, capital) followed by suitable labor (employees) and operating conditions. Educational and training opportunities and access to research and development facilities are considered least important.

- In general, there is a high level of satisfaction with infrastructure features. Satisfaction is higher with features considered more important.

- "Taxes and Regulations" is a distinctive infrastructure feature. Considered of high importance; it is associated with the lowest level of satisfaction.

- High-growth new firms consider four infrastructure features substantially more important than others: labor costs, capital availability, availability of skilled workers, and transportation. They tend to be relatively satisfied with all four.

- Interest in 28 services provided through a broad range of state sponsored economic development programs varies substantially. Half of all new firms show high interest in working capital financing, one in ten a high interest in assistance to develop foreign export markets.

- High-growth new firms indicated more interest in all economic development program services, but particularly those related to training employees, financing, and development of management/administrative skills.
- Exporting new firms had a distinctive interest in economic development program services related to the promotion of federal procurement, research and development, and developing foreign export markets.
- New firms that had used any of the economic development program services showed greater interest in all the services.

### C. Implications and Recommendations

There seems to be little doubt that new firms are one major source of contributions to Pennsylvania. Attention to the problems and needs of new firms could have substantial benefits to the state.

The lack of precision in the estimates of new firm births reflects, not a lack of data, but poor use of existing information. Annual unemployment insurance filings (ES-202 data) could be used to provide precise information on the industry and location of new firm births without compromising confidentality. [1]

New firms are started where the start-up team members live. Attempt to recruit new firms are unlikely to be very successful. Attracting expansions or relocations of established firms may be worthwhile.

Programs designed to enchance out-of-state exports might emphasize distributive services and business services as well as manufacturing.

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[1] This problem is a key issue in any attempt to study business establishments, particularly those with employees. The willingness to make this data available varies substantially among the states. Mississippi has, for some time, annually published reports on establishment births and deaths, by industry and county, based on this "tax data."

The export orientation of the new firm is more critical than the industry sector.

General programs to assist all new firms by improving the "business climate" may have a positive impact. But considering the large number of new firms and the multitude of factors affecting their contributions, the impact or efficiency of such programs may be difficult to determine. In short, using only untargeted public policies and programs it may be difficult to improve the "business climate", know if it has been improved, or know if improvements are promoting economic growth.

There is no question that new firms are dissatisfied with "taxes, regulations." It is not clear if this is a reaction to their existence or their administration by state agencies. More effort to explain and assist new firms with taxes and regulations might reduce dissatisfaction with these requirements.

The small proportion of new firms (less than one-third) that account for the majority of contributions suggests that targeting high potential new firms for assistance could be an efficient, effective strategy for improving new firm contributions. While mechanisms for identifying such firms are not well developed, the success of locating them for this survey suggests it is a manageable problem.

On the other hand, almost two-thirds of new firms have modest or low-growth profiles. New firms starting small and staying small are numerous; perhaps 13,000 are initiated in Pennsylvania each year.

Targeted economic development services, such as those currently sponsored by the Commonwealth of Pennsylvania, were found to be favorably received by a significant number of new firms, particularly high-growth new firms with a strong potential for contributions (jobs, sales, and exports).

# BUILDING APPALACHIA'S CAPACITY TO COMPETE

A PRESENTATION TO THE APPALACHIAN REGIONAL COMMISSION

FEBRUARY 22, 1987

SUMMARY OF FINDINGS FROM SRI INTERNATIONAL'S ASSESSMENT OF ECONOMIC INFRASTRUCTURE IN APPALACHIA

## OUR CONCLUSIONS

Appalachia can lead in economic development if it:

- Focuses more of its economic development effort on existing industries than on new industries.
- Recognizes the need to target near-term industry needs separately from long-term development needs.
- Works toward regional rather than state-level solutions to some long-term problems.

## BASIS FOR CONCLUSIONS

### I. NEED FOR NEW ECONOMIC INFRASTRUCTURE

Appalachia has repaired many of its weaknesses in physical infrastructure.

The region's economy also requires a better economic infrastructure:

Access to technology: university R&D, industry R&D, federal laboratories

A skilled and adaptable work force: primary and secondary education, community colleges, universities, industry-based training

Availability of capital: financial institutions, venture capital, regulatory policies

### II. ADEQUACY OF NEW INFRASTRUCTURE IN APPALACHIA

SRI has explored the adequacy of the region's economic infrastructure in two categories:

Near-term infrastructure: industry-specific mechanisms that meet immediate technology, skills, and capital needs of firms. Many of these mechanisms are private, but some are also public.

Long-term infrastructure: the region's technology, skills, and capital base, which is largely (although not entirely) provided publicly.

## NEAR-TERM INFRASTRUCTURE

**The problem:** Regional industries such as auto suppliers, apparel and textile, and chemicals report they have less adequate infrastructure sources than firms outside the region.

The following steps are needed:

**Technology**

The region has a broad range of technology extension and technical assistance programs. Current strength in extension should be capitalized upon.

Examples--Pennsylvania's PENNTAP and N.C. State's Industrial Extension program.

**Human Resources**

The region's well-developed system of 2-year community and technical colleges should be utilized as a focal point for industry-specific training for the "new technicians" required by industry in the region.

Example--Haywood Tech's R&D center in Clyde, North Carolina, provides broad-based training in the most advanced manufacturing technologies that is closely linked to local industry's changing needs.

**Capital**

Brokerage efforts to assist firms in gaining access to capital by bringing private financial institutions together with borrowers, and by packaging loans using public funds as leverage, should be encouraged.

Examples--Alabama's Southern Development Council and the Kentucky Highlands Investment Corporation use their public funds to leverage private investments. The Atlanta Technology Development Center and Venture Focus in North Carolina cut down the information costs that investors face by screening applicants.

## LONG-TERM INFRASTRUCTURE

**The problem:** While the region's long-term economic infrastructure base is less developed than in other parts of the U.S., a realistic strategy for building capacity is needed to improve Appalachia's competitiveness.

The following steps are needed:

**Technology**

Many current state efforts to build a long-term technology capacity focus unduly on high-technology industries--efforts should focus more on ensuring that existing industries have access to developments occurring both here and abroad.

Example--The Michigan Biotechnology Institute applies biotechnology innovations to Michigan's existing industrial base.

**Human Resources**

Basic education reforms now under way in most Appalachian states should continue, be given major priority, be sustained over the long term, and also extend to all levels of the educational system.

Examples--Ohio's efforts to redefine the role of its community colleges in the region, Kentucky's to look at the role of its higher education system in economic development.

**Capital**

State efforts to create public capital funds may be too small and limited unless strong efforts to leverage private capital and broker resources are undertaken. States should seek to stimulate the availability of private capital through regulatory and other changes.

Examples--Regulatory changes such as Michigan's use of pension fund investments, and Ohio's linked deposit program.

## ACTION AT THREE LEVELS

**State**

States can obtain important payoffs building on existing strengths in technology extension, basic education reform, and industry-specific training and brokerage mechanisms to increase access to capital.

Example--Broaden "Quick Start" training programs.

States should balance their focus on emerging, high-technology industries with efforts to apply technology and provide training and capital assistance to a broader range of industries.

Example--New York's Productivity Development Program helps traditional industries evaluate the use of new process technologies.

**Regional**

Centers of excellence in research and development should be developed on a multi-state basis.

Example--The Commission on the Future of the South's multi-state strategy.

Public-private partnerships should be encouraged to provide technology and training assistance to firms on a state or multi-state basis.

Example--Auburn University's sourcing fair.

Institutions like the Commission can play an important role in supporting demonstrations and information sharing among the states.

**Federal**

New federal investments in science and technology centers might appropriately be located in the region. Since most of these will be located outside of the region, however, mechanisms to ensure that the benefits of centers reach the region's industries need to be developed.

Limited state resources to support education may require expanded federal assistance, especially since the region now—and possibly in the future—exports many of its highly trained people.

## FINAL POINTS

States and the Appalachian Regional Commission have been active in building elements of the new infrastructure, but can now lead the way to the next stage of economic development by:

1. Developing a specific focus on economic infrastructure

   Recognize the importance of both new economic infrastructure and traditional infrastructure programs. Also, all three elements of the new infrastructure must be addressed in a comprehensive way.

2. Creating innovative public-private programs

   For example, today private firms in the U.S. spend more money than public institutions on post-secondary education. Public efforts to improve worker skills must recognize and draw upon these new resources.

3. Using modest new public investments to encourage complementary private investment. Using 100% public funds to support capital funds, training programs, and long-term research intended to meet industry needs should be a thing of the past.

4. Distinguishing carefully between the near-term needs of industry and the long-term needs of a healthy economic base. Helping each requires:

   - Different institutions
   - Different time frames
   - Different programs

## FUTURE OF ARC

Senator SASSER. Thank you very much, Ms. Pizzano. This is really a unique experience for me to hear an Administrator testify in favor of zeroing out their agency, and I must say that speaking as one Senator, I do agree with your perception that this committee is probably not going to agree with that request. It is my view that the Appalachian Regional Commission will be funded again this year.

It is my view that the ARC has done good work in the past, and I think there is still much left to be done in the Appalachian regional area. I only have to meet and talk to the county executives and mayors in the areas of my state that are served by the Appalachian Regional Commission to realize there is much left to be done and how much they will rely on the ARC to help them; I have only to go out into the rural counties in my state that are served by the ARC to talk to the people; see the joblessness that is still present there; see the deprived health conditions of some of the people; see the low educational levels; in many cases, poor road infrastructure, to realize that we have not yet completed the task that was undertaken with great vigor in the early 1960's.

I look forward to the day when we can complete that task. In my view, we are not yet there.

I want to defer now to my senior colleague, Senator Stennis, for any questions or observations that he might have at this time.

Chairman STENNIS. Thank you very much, Mr. Chairman.

I am so glad that you have managed to get to this part of the hearing this morning. These appropriations bills are going to start moving before too long, now, and hearings will be finished before long.

Mr. Chairman, I think you have already summed up unusually well the nature of this work and answered the criticisms, too, the criticisms you hear, according to my personal observation. A great deal of it is by people that really don't know and understand the facts. They haven't seen the work, the character of it and the kind that it is—the quality, the results.

When you really go examine what they are doing, you find that there is no subject matter that they aren't putting in the time, and they are getting tremendous results according to my personal observation.

That is the basic reason why I support this program. I tell you that rather than being among the first that we are going to just discontinue, why, I don't want to discontinue it at all. But if you are going to try to sweep the board clean, let it be last. Long before that day gets here, there has been a change of policy, I think, to treat it last.

Really, I was amazed myself at a lot of the things that I saw that they were accomplishing and carrying on in such a fine way. I am delighted to know that it does have, the program as a whole, does have strong enough support here to survive year after year after year even though there is not a request and not pressure behind it to support the program as furnished by the administration.

I found there is a fine knowledge, though, among the membership of the elected officials, both in the Senate and in the House, that understand; they understand this program and have personal knowledge of it. They want it to continue. That is a very hopeful situation.

### PREPARED STATEMENT

I want to ask you if I may submit for the record a statement and written questions to be supplied and answered by the competent people that are appearing here today.

Senator SASSER. Without objection, that will be done.

[The statement follows:]

### STATEMENT OF SENATOR STENNIS

Mr. Chairman, the Appalachian Regional Development programs have been a major contributor to economic growth in the Appalachian region since the program's initiation in 1965. Mississippi became part of the program in 1967. Since that time, ARC has been an essential part of economic development in northeast Mississippi. The Appalachian regional programs have helped fund over 500 projects in Mississippi during the past 20 years. These have made a highly important difference in the economic growth of the area.

Now the President's budget proposes not only to eliminate the Appalachian program, but also to eliminate or severely reduce every other development program important to the future economic vitality of our rural areas. These are the areas with small populations and small tax bases which cannot develop without some sort of federal assistance. We cannot allow our rural areas to be abandoned by the federal government; the consequences are too severe.

Again I want to praise the good work of the Appalachian Regional Commission and pledge my support for continued funding of its programs at levels which will have real meaning to the economic growth of the region.

Chairman STENNIS. I salute all of you and thank you, too, for the very fine service. I know of your record. Thank you very much.

### ADDITIONAL PREPARED QUESTIONS SUBMITTED FOR THE RECORD

Senator SASSER. Thank you, Senator Stennis. I also have some questions in addition to those of Senator Stennis, to submit for the record on behalf of Senator Robert Byrd, the distinguished majority leader and a strong supporter of the Appalachian Regional Commission, which I will submit, Ms. Pizzano, and ask you and your colleagues to respond to as expeditiously as possible.

I understand that the subcommittee chairman, Senator Johnston, and Senator Specter will have some questions as well.

[The questions and answers follow:]

## Questions Submitted by Senator Johnston

**Question:** What, in your view, is the economic condition of the Appalachian Region at this time and how does that compare with the rest of the nation?

**Answer:** The economic condition of the Appalachian Region can not be easily described as either good or bad. Rather, as one would expect, it is mixed, both in comparision with the Appalachia of seven or eight years ago and with the rest of the nation.

On one hand, we have a Region disproportionately dominated by low-skilled manufacturing and coal-related activities, both of which are losing jobs, some permanently. Other areas of the economy still have not fully recovered from the recession while other, most notably including textiles and steel and related industries are being seriously and often successfully challenged by overseas competitors.

On the other hand, while the U.S. unemployment rate is about 7.0 percent, Appalachia's is 8.7 per cent and narrowing. Four of our states (GA, NC, NY, SC) have unemployment levels in 1986 at or below the U.S. average. 25 percent of all our counties have unemployment rates near or below the U.S. average. In the past year alone, there has been a growth in jobs of almost 200,000 — almost 500,000 since 1980. And, a number of Appalachian counties are now economically competitive with any in the nation.

**Question:** To what extent has the ARC's programs, both highway and non-highway, benefited the people of Appalachia in terms of job creation and alleviation of poverty?

**Answer:** During the last twenty-two years, the Appalachian Regional Commission has had a positive and constructive role in improving the economy. For example, during that time the Commission has, in general terms, provided assistance in building the Region's infrastrucuture of highways, sewer and water facilities, and other physical facilities including those for health and education. In addition to assistance with improving the Region's physical infrastructure, the Commission has responded to human infrastructure needs by developing programs aimed at enhancing the health and educational levels of Appalachians and by developing state and local institutions by working with state government and local development districts in an effort to coordinate various programs and to improve the service capabilities of government.

Specifically, in terms of jobs created and retained, from 1983 through 1986, through an ARC Jobs and Private Investment Program expenditure of $91,500,000, approximately 31,000 new jobs were created and 32,000 existing jobs retained which would otherwise have been lost.

Based on a 1981 survey, we believe that new and expanded plant locations located on or near the ARC supported highway system has resulted in 215,000 direct jobs with an equal number of jobs in surrounding retail, commercial and service industries.

**Question:** In what ways, would you say, does the Appalachian Region differ from other rural areas of the country? What should be the role of the Federal government?

Answer: The Appalachian Region of today differs from other rural areas of the country in that it is largely a non-farm rural area. Even so, however, the manufacturing and mining dependent communities which abound in the Region have characteristics similar to those in many farm communities. Both types have severe problems of displaced workers caused by the wrenching restructuring of the Regional (and national) economy, both attempt to maintain local governments experiencing increasing financial difficulties, and both are very uncertain about the future for their sons and daughters.

While it is true, for the reasons I stated in my testimony, that I support the Administration's position that the Appalachian Regional Commission has basically completed its mission and should now be terminated, that is not to say that the Federal government no longer has an appropriate role affecting Appalachia. That role, in my belief, should include the following in an effort to meet rural economic needs not better met by others:

1. remove unnecessary administrative and regulatory barriers to economic investments;
2. provide incentives for programs in consolidation of local services, technology, entrepreneurship and education; and
3. permit states more flexibility in established Federal programs to accomodate differences within the states.

Question: In what ways does the issue of competitiveness affect the general economy of Appalachia, including its workforce and industries?

Answer: The Appalachian economy is likely to be more adversely affected than the country as a whole by shortcomings in U.S. competitiveness. These shortcomings include a negative trade balance, radical changes in foreign technology, an underdeveloped workforce, and a strong dollar.

Specifically, primary Appalachian industries, particularly coal and wood, have seen their export expectations frustrated, while durable and non-durable manufacturing goods alike have lost both foreign and domestic markets due to an inability to match costs of producing abroad.

Question: What new initiatives have you proposed or initiated in the last year at ARC?

Answer: Last year, I initiated a major proposal to comprehensively restructure the ARC program. Subsequently, the Commission staff and representatives of the 13 Appalachian states re-evaluated the needs of the Region and its various components, a response also in part to encouragement from Senate Committee Report language and to changes in the economy. After looking carefully at the Region as a whole and at the economics of each Appalachian county, the Appalachian Governors joined me last month to begin a new ARC program that will allow greater flexibility to the states plus new incentives to encourage innovation.

The new program, in abbreviated form, consists of the following elements:

1. The Regional Program Initiatives which encourages investment in human infrastructure projects such as technology transfer, education and job training;

2. Distressed Counties which consist of counties designed by criteria reflecting poverty rates, per capita income and unemployment, and which become eligible for up to 80 percent of ARC funding;

3. Economically Competitive Counties which consist of those counties identified by each state which have made and are sustaining substantial economic achievement and which become eligible for up to 30 percent of ARC funding for typical infrastructure projects; and,

4. Area Economic and Human Resource Development projects which broaden the base of ARC's basic programs by encouraging the creation and expansion of industrial and service enterprises, developing skills for Regional jobs, and developing and strengthening local goverment. Such projects are eligible for up to 50 percent of ARC funds.

Question: How much interest have the various Appalachian state governors shown in the Commission over the past 2-3 years?

Answer: Some Governors have shown more interest in the Commission than others and, of course, some are simply not so familiar with the program and its history. For years, the Commission has held two Governor's Quorum meetings each year, but in the last three years there has been only one meeting per year.

Question: What is your assessment of the states ability to pay in the cost sharing formulas of ARC programs?

Answer: The states, in general, appear to be handling their share of the costs of projects quite well. For those communities designated as "distressed" and do not have sufficient resources to raise their share of the match, ARC will assist up to 80 percent. Conversely, those counties that are economically competitive will receive up to 30 percent assistance. This is, in my opinion, a fair approach. As Governor Martin of North Carolina said at our last Quorum Meeting, "those counties that can pay a higher share should."

Question: How much emphasis on education should be stressed in the ARC programs to achieve the goals of the Commission? What has the Commission done recently to address the problems of school dropouts?

Answer: The Commission has always well understood the value of a well-educated citizenry to the social and economic well-being of the Region. In support of that understanding, ARC has funded over $500,000,000 in projects for general, vocational, and higher education over the years.

Now, we are focusing our energies and resources toward addressing the alarming dropout problem in Appalachia. Consider for a moment the following facts:

— The national dropout rate is 23.9 percent - one out of four students leaves school without a diploma.

— The dropout rate in some inner cities and in some parts of Appalachia is 50 percent.

— Dropouts are two-and-a-half times more likely than high school graduates to be unemployed.

- By age 25, even employed dropouts earn only two-thirds the income of those who stayed in school.

- Only one in six jobs is suitable for a high school dropout. Those odds will grown worse as technology advances.

- Up to 80 percent of some prison populations are high school dropouts.

- Dropouts are more likely to need unemployment compensation, public health care, welfare, and public housing, all costing taxpayers millions of dollars every year.

These are stark realities - and economic facts in a world marketplace. In Japan, the dropout rate is 2.2 percent. While American factory workers sometimes cannot decipher simple safety warnings, Japanese workers can read complex instructions and operate highly sophisticated machinery. The handwriting is on the wall and it does not bode well for Appalachia.

The ARC Dropout Prevention Program, then, is directed toward helping people and organizations find the right role—and get involved. ARC has already committed $2.5 million in grants to 11 states. Forty-six new dropout prevention programs, six technical assistance programs, and a public awareness campaign constitute an ambitious assault thus far on the dropout problem. And we will do more.

Question: What activities is the Commission currently undertaking in the area of rural health care?

Answer: The Commission proposed a three-year health finish-up program to complete its mandate to assist the development of needed health care facilities and services in Appalachia. The program was completed in fiscal year 1985 and, by that time, we had accomplished our major goals of:

1. providing basic health care within 30 minutes of all people in the Region, with the possible exception of those living within 12 of the Region's 397 counties,

2. reducing the infant mortality rate so that in 1981 it was 11.95 (deaths per 1000 births) compared to 11.9 of the U.S. rate, and

3. assisting the communities of our Region in physician recruitment and placement in underserved towns and hamlets.

Now the Commission is looking, through the funding of two separate studies, at several major problems directly affecting the health care of many Appalachians.

First, we are concerned about issues affecting access to health care for the medically indigent in the Region, especially in a period when health services everywhere are changing. Our study, then, is designed to:

- provide reliable estimates on the number of medically indigent in Appalachia

- explore issues of access to care by the medically indigent, and

- identify potential strategies for sustaining and improving care to these indigents.

Secondly, we are concerned about the financial solvency and survival of many of the Region's rural hospitals. Our second study, then, has five objectives:

- to document whether in fact and to what extent the financial solvency of rural hospitals in Appalachia is negatively affected under the prospective payment system used to reimburse hospitals for hospital care of Medicare patients.
- to examine policy issues with a view to alleviation of problems faced by hospitals and the rural health care system, if any problems are found to exist
- to examine the impact of PPS compared to other impacts affecting the financial operation and structure of a typical Appalachian rural hospital
- to explore how changes in the provision of health care and reimbursements have changed and will continue to change the rural health care delivery system — to develop future strategies to maintain and improve rural health care in the face of changes brought by PPS and other influences.

Question: What is the current status of the Appalachian highway program?

Answer: Of a revised total system of 3,042 miles, 1016 miles of the Appalachian Development Highway System remains to be completed. Through FY 1986, approximately $3 billion of ARC funds have been allocated to the 13 states for highway construction.

The Commission is about to begin a new study of the cost estimates for the remainder of the Highway system, since the cost estimates currently being used are from the late 1970s.

Question: What other Federal programs are there that provide programs similar to those of the ARC?

Answer: There are several Federal programs that provide similar assistance as ARC to all areas of the country including Appalachia.

HUD–Community Development Block Grant program makes grants to state and local governments to fund local community development projects that support housing rehabilitation, economic development, public works and other activities that create and retain jobs. The Administration proposes to target this assistance to distressed communities.

DOT-Federal-Aid Highway System provides funds by Federal highway user fees for highway construction and repair in all states.

HHS-Primary Care Block Grant program provides grants to States for operation of community health centers in medically underserved populations. The Administration proposes to no longer require the States to match the Federal contribution.

Department of Labor - Job Training Partnership Act provides job training, job finding, and relocation assistance to workers who have lost their jobs due to plant closings, technological change and increased imports. The Administration proposes to continue this program with reforms allowing allocations to the States according to needs rather than an arbitrary formula that speads resources to all states regardless of need.

Department of Education - Vocational Education program provides assistance at the secondary and postsecondary levels. The Administration proposes to focus Federal resources on programs for populations that have long been underserved by vocational programs.

Question: What is the Administration's rationale for requesting no funds for ARC for FY 1988?

Answer: As you know, the Administration has been recommending the termination of ARC since 1981. It is the Administration's policy as stated in the President's FY 1988 Budget proposal, to rely on the private sector to provide the major stimulus for economic development.

The Administration further believes that ARC development programs assist rural districts that are no worse off than rural communities elsewhere, and are therefore not deserving of special assistance.

Question: What would be the affect of the proposed rescission upon ARC projects and activities planned for FY 1987?

Answer: As you know, the Administration had proposed that $31 million of our $105 million FY 87 budget be rescinded. This amount was what was committed to ARC projects at the time the recission request went forward.

Of the $31 million, approximately $3 million of access roads and $28 million of non-highway projects would have been unfunded if the rescission were to have carried.

However, since Congress did not act on the Administration's rescission proposal, it failed and the proposal expired on March 15, 1987.

Question: What steps have you taken regarding the directions given in the FY '86 Senate Energy and Water Appropriation Committee Report?

Answer: The Committee recommended that the ARC share of the total cost of most area development projects be 30 percent. The Commission has adopted that recommendation under its new code with respect to a new program called "Economically Competitive Counties." These counties will be identified by each state using ARC criteria based on data showing that these counties have the economic base to raise a larger portion of the matching share. Typical infrastructure projects in these counties will get only a 30 percent match from ARC.

## QUESTIONS SUBMITTED BY SENATOR SASSER

**Question:** I understand that the Commission has made changes in its programs. Could you describe them — especially the changes in the federal-state matching share?

**Answer:** Yes, Senator, we felt it was time to restructure the area development program at ARC.

Last year, I, along with representatives of the 13 states, re-evaluated the needs of the Region and its varying components. As a result, the Appalachian Governors joined me last month to begin a new ARC program that will allow greater flexibility to the state plus incentives to encourage innovative.

There are four new program areas. The first is called Regional Program Initiatives which will encourage investment in strategic initiatives to improve economic competitiveness. Projects in this category will either: (1) address specific economic opportunities such as technology transfer, promoting entrepreneurship and export development; or (2) tackle human resource problems such as school dropouts, adult literacy, and rural health care. For these projects, ARC's share from a states' allocated fund can be up to 80 percent for start-up and first year operation (50 percent thereafter).

The second program area is basically unchanged from the "Finish-up Program" and that is Distressed Counties which offers assistance for a wide variety of projects for those designated counties. The only change is that infant mortality was dropped as a criterion for designation as a distressed county. Designation is based on: per capita income no greater than 2/3 of U.S. average; poverty rate 150 percent or greater than U.S. average; and three-year unemployment rate 150 percent greater than U.S. average. Approximately 88 counties will be designated for fiscal year 1988, currently there are 76 counties. The ARC share is up to 80 percent of total project cost in this category.

The third program area is called Economically Competitive Counties. Each state will identify, using our criteria, counties that have a poverty rate at or below the national average; three-year unemployment at or below the national average; and per capita market income no less than 80 percent of U.S level. The ARC match will be limited to 30 percent of total project cost for most projects.

The fourth program area is called Area Economic and Human Resource Development. This category broadens the objectives of ARC's basic program to encourage creation and expansion of commercial and service enterprises, developing skills for regional jobs, development of infrastructure, human resource and housing programs that support growth opportunities and developing strengthening local government. This program will permit waivers of funding for "pockets of distress" exhibiting characteristics similar to those used for designation of distressed counties. The ARC share will be up to 50 percent of total cost, total Federal participation can be up to 80 percent using other agency funds except CDBG funds.

**Question:** What are some of the other changes you've made in the ARC programs?

**Answer:** Other recent changes that were adopted at the last Governors' Quorum Meeting concern the highway program. The states, if they feel it is necessary, can now transfer up to 10 percent or $500,000, whichever is greater, from their highway allocation to area development. This allows the state to have the flexibility to utilize yearly funds in the manner which they see as being the most beneficial.

We also approved a study of the cost estimates for the Appalachian Development Highway System. The cost estimates currently being used are from data collected in the late 1970s. This will enable the states to re-evaluate their priorities on the highway system.

Question: I have a couple of questions about the distressed counties portion of ARC. I understand that the Commission no longer considers infant mortality in determining distressed counties. Why was that dropped from the formula?

Answer: Infant mortality was deleted as a criterion because it proved not to be consistent with other more direct measures of the need for financial assistance. Such measures as unemployment and poverty rates provide broader guides to both the ability to support essential services and the relative development status of an area. As a result of dropping infant mortality criterion, the Commission is better able to focus its resources on areas of chronic economic distress.

Question: I'm concerned about this because infant mortality is still significantly higher in Appalacha than in the rest of the United States. And it certainly goes hand in hand with high levels of economic and social distress. Are we sure that dropping the infant mortality factor isn't understating the conditions in some of these counties?

Answer: We have found that high infant mortality rates are not limited to the distressed counties that need financial assistance for basic water and sewer. The reduction of infant mortality rates has been adopted as a Regional Program Initiative, and projects addressing this serious problem can receive an enhanced level of ARC funding — up to 80 percent of costs — regardless of location.

Question: Another question I have in the area of distressed counties is that, at least in looking at the list for my State of Tennessee, there seems to be a fairly high level of change from year to year in the specific counties on the list. I travel in East Tennessee frequently and I can tell you that economic conditions aren't improving that quickly. Why do the designations change so often? The conditions certainly don't.

Answer: Fiscal year 1988 will be the first year since the original designation of distressed counties in FY 1982 that significant changes have occurred in the list. In 1982, there were twelve Tennessee counties on the list, ten of which will continue to be designated. Between 1982-1985, six other counties were added, based on updates of average unemployment and infant mortality rates, the two most volatile indicators. Only one of these six counties will be designated in FY 1988. Four Tennessee counties will be designated for the first time in FY 1988.

Question: It would seem that such frequent changes would make it difficult for the development districts to have any stability in their financial planning. What steps is the Commission taking to ensure that these constant changes are not creating undue hardships on planning by development districts.

Answer: None of the development districts have identified changes in the distressed county progam as a particular problem, to my knowledge. I should also note that, if there is a particular problem for a specific community, i.e., a "pocket of distress" in a county that otherwise does not meet the distressed county criteria, we now have a policy that allows that community special consideration based on their circumstance.

Question: In fiscal year 1985, ARC had an infant mortality reduction program. Please describe what that program was designed to do and what permanent benefits came out of it.

Answer: Infant Mortality and low birth weight of infants have long been recognized as particularly serious problems for Appalachia. In Appalachia's 397 counties, 3,679 infants died in 1982, and well over 19,000 women received no prenatal care or late prenatal care. In that same year, infant mortality rates, though halved since 1960, were still higher than the national average in 175 Appalachian counties, and rates in 37 counties were nearly twice the national rates.

These problems continued in parts of the Region despite ARC success in providing primary health care, including prenatal care facilities within reach of the overwhelming majority of all Apppalchians, and in recruiting and placing physicians in shortage areas of the Region which otherwise would not have been served. Thus, though a strong network of hospitals, health departments, child care centers, social assistance agencies and private practitioners work to provide for the health of expectant mothers and infants, pockets of unacceptably high infant death rates still persist. The new initiative to reduce these rates was born out of the realization that availability of health care for high-risk mothers was one thing, utilization was quite another. The immediate need seemed to be for an outreach program, a conduit, so to speak, to link those needing services to those service providers already in place to fill those needs.

Thus, the ARC Infant Mortality Reduction Volunteer Demonstration Program was designed and set into motion in five locations whose infant mortality rates were resisting conventional approaches. These locations were Middlesboro, Kentucky; Hazard, Kentucky; Bluefield, West Virginia; Caldwell County, North Carolina; and Tippah, Mississippi. Each project site received $25,000 for one year of activity, after which other resources were to be obtained from other sources for further activity. At least two projects are still functioning at the same or higher levels of service than orginally sustained during the first project year commencing almost 2½ years ago.

The Appalachian Regional Commission's IMR program concentrates on delivering four major services:

- prenatal medical care
- assistance in modifying personal habits that are potentially harmful to unborn infants
- nutritional supplements and advaice
- social service assistance.

In each of the communities involved in the new program, sponsors and volunteers bear primary responsibility for attaining the program's objectives. Each program is established in a community by a sponsor that organizes and directs the local program, since those in the community are usually those best able to determine local needs and to mobilize local resources. The sponsor in any given community community can be a hospital, health department, senior citizens organization or just about any othre communitywide health, social service or civic group.

The program sponsor:

- defines local service areas and scope of the program
- designates a director to administer the program
- establishes program policies and procedures
- trains, supports and supervises volunteers
- assures services offered are those needed in that particular community.

The only element of the program more critical to its success than the supervisors is the volunteers, who provide a wide range of supervised, non-professional services, such as:

- help in distributing information about availability of health and social services and good health practices
- escort services to medical appointments, counseling sessions and so forth
- encouragement of family participation
- provision of follow-up services to high-risk mothers to ensure they receive prenatal and postnatal services
- assistance for new mothers in planning for infant care.

I believe that ARC has successfully demonstrated that activities designed to reduce the incidence of infant mortality and morbidity through the use of volunteers and sponsored by a variety of types of organizations can be achieved and maintained with a very modest investment. I further believe that we have made a permanent impact on the way health providers in Appalachia indentify with and relate to high-risk mother in their areas and provide for their welfare more sensitively and deliberately than in the past. I also believe that we have had a major role in increasing the awareness of communities throughout Appalachia of the problems associated with high infant mortality and their impact upon the general welfare of all citizens.

Question: One of your principal interest at the Commission has been dropout prevention. This is still a big problem in Tennessee, where the school dropout rate is about 28 percent. What specifically are you doing over at ARC on this problem?

Answer: The Commission has responded to this problem in three ways:

- Funds were allocated for dropout prevention/remediation programs with a requirement that private sector support be an integral part of each project.
- Technical assistance efforts were inititated to make dropout prevention expertise available to Appalachian communities.
- Commission policies were liberalized to give Governors greater flexibility in using ARC funds for dropout prevention programs.

The Commission has committed nearly $2.2 million for dropout prevention efforts in the Region dincluding forty-six projects and five technical assistance programs. These projects generally became operational during August, 1985 - January, 1986 time period, therefore having been opeational less than a year. Some projects will become operational in the coming school year. The cost of individual project grants ranges from $2,500 to $47,000. Technical assistance grants range from $9,000 to $161. An effort was made to fund projects of a reasonable cost so that continuation after the period of Commission support was likely.

Guidelines for grants are flexible. State or local school systems and other public or private nonprofit organizations may apply. Funds are not approved for sectarian religious purposes. Examples of eligible activities include but are not limited to special tutoring or counseling; work-related training; alternative classes; parental involvement; state or Regional program facilitation or technical assistance; or combinations of such activities. Innovative and nontraditional approaches to the design or delivery of these or similar activities are encouraged. Program must include strong community involvment (such as schools, parents, businesses and civic organizations) and appropriate linkages to public and private agencies (such as those for job counseling, social and health services). Activities for which support is requested must be geographically limited to Appalachia, and must address middle, junior or senior high school potential dropouts, or recent dropout populations. Priority is given to program proposals which include significant financial participation by the private business sector.

Of the forty-six projects, over one-half (25) are located in Kentucky. Both Tennessee and West Virginia have four projects, while Alabama and Mississippi have three each. Two projects are being funded in Georgia, two in Virginia, one in Maryland, one Pennsylvania, and one in North Carolina. At the present time no Commission assistance is being provided in New York, South Carolina, or Ohio.

Categorizing the projects by the commonly used approaches i.e., tutorial activities, alternative curriculum or classes, work-related activities, counseling/advising, attitudinal/self-awareness activities, attendance incentive activies, and parental involvement, it is seen that in eleven projects the major component is an alternative class or curriculum and in nine projects the emphasis is counseling. Three projects are primarily tutorial, while one each focuses on work related activities, and parental involvement. This leaves twenty projects which, while possessing to a degree some or even all of the above characteristics, are best identified as public awareness - community and business involvement projects.

Question: Economic development programs are a major part of ARC's function. What type of projects does ARC favor and find to have the most lasting benefits?

Answer: ARC does favor projects that have lasting benefits to the Region. Projects that have private and local participation, create permanent jobs for communities and attract industry which are beneficial to rural areas. Human resource projects that better educate Appalachians through remedial programs, literacy efforts, job training for available jobs and school dropout prevention are the types of projects that provide the most long-term benefits by providing a well developed and flexible workforce.

Question: Also, the vast number of jobs in Appalachia are in small and medium-sized businesses. How does the ARC allocate its spending to encourage this type of economic development?

Answer: Encouraging the development of small businesses has been one of my main concerns and efforts here at the Commission.

We have encouraged states to apply for projects out of their allocations that would assist in the development of entrepreneurship in Appalachia. ARC has awarded grants to develop programs to identify potential exporters and provide them with training and technical assistance; develop feasibility studies of the applicability of new processes and technological innovations in existing industries; provide technology transfer by matching business and industry needs with university research and to identify research with commercialization potential; and to set up revolving loan funds to small businesses for plant improvements or for working capital.

## QUESTIONS SUBMITTED BY SENATOR BYRD

Question: What improvements have been made to the education levels in the 397 Appalachian counties since the Commission and its programs were funded 22 years ago?

Answer: The Commission's major educational goal was to construct a network of secondary and post-secondary vocational education facilities that would teach skills that would enable individuals to get jobs regardless of where they chose to live and to build into school systems the capability to respond as the demand for skills changed. To date, ARC has invested over $355 million in building and equipping more than 500 vocational education schools serving over 400,000 students and the regionwide network of facilities is now in place. Thus, the percentage of Appalachian 11th and 12th graders enrolled in vocational education has more than doubled between 1965 and 1980.

However, a significant number of Appalachian counties still have many educational problems. For example, the percent of Appalachians attending college is two-thirds of the national rate, 156 of the 397 Appalachian counties in 1980 had high school dropout rates that were more than one and one-half times the national rate. Adult literacy has remained almost constant, hindering the development of a skilled and adaptable workforce. Forty-six percent of the unemployed in the Region are illiterate. Therefore, in recent years the Commission has mounted a major effort to improve the basic skills of the Region's youth and to attack the Region's dropout problems by funding demonstration dropout prevention programs.

Question: How about improvements in health statistics?

Answer: The Commission has accomplished its major goals in the health area by providing basic health care within 30 minutes of all people in the Region, with the possible exception of those living within 12 of the Region's 397 counties.

Currently, the Commission is funding two health related studies, one regarding issues affecting access to health care for the medically indigent in the Region, and the other regarding the financial solvency and survival of rural hospitals under the Medicare PPS system.

Question: In Appalachia now on par with the economic conditions of the rest of the country?

Answer: Statistics show that the Appalachian Region as a whole has been approaching being on par with the nation as a whole. In 1984 the average per capita market income for Appalachia was $8,462 and for the nation is was $11,007. The average annual unemployment for 1986 was 8.7 percent for Appalachia and 7 percent for the nation. According to 1980 U.S. Census data, the percent of the population living in poverty was 14 percent for Appalachia and 12.4 percent for the nation.

While major improvements have been made, Appalachian counties underperform the nation as a whole. The Region is disproportionately dominated by manufacturing and coal, and unfortunately, related activities and jobs are dropping in these industries.

Question: What percent of the Nation's counties are located within the boundaries of Appalachia and what percent of the nation's "distressed" counties are located there?

Answer: Some 397 of the Nation's 3134 counties are in the Appalachian Region, or 12.8 percent. Of the 272 counties in the Nation meeting the distressed county criteria, 88 are in Appalachia, or 32.4 percent.

Question: So, an overwhelmingly disproportionate share of "distressed counties, eighty-eight in all, are located in the area served by the aPpalachian development programs. I understand that fifteen of these counties are in West Virginia. What realistic prospect is there for improving the economic situation of the thousands of unemployed and underemployed people in these "distressed" counties without continued development assistance?

Answer: Many of these distressed counties have demonstrated that they lack the resources to make economic progress. For many of these areas this slow development has persisted for years even with the kind of development assistance that ARC has provided.

Question: Do you believe that my state of West Virginia is in a position to fund one hundred percent of the cost of the development programs needed?

Answer: Many rural areas of the country have found that "belt-tightening" has required them to consolidate services. Certainly there would be a need to concentrate on providing critical services and more effective delivery systems.

Question: How many miles of Appalachian highways have been completed in each state and how many remain uncompleted and unfunded at this time?

Answer: 2025 miles of the Appalachian Development Highway System have been constructed, leaving 1016 miles of the total system uncompleted. The state-by-state totals of completed and unfunded mileage is as follows:

| State | Completed Miles* | Unfunded Miles |
|---|---|---|
| Alabama | 103.1 | 141.1 |
| Georgia | 101.3 | 33.4 |
| Kentucky | 345.9 | 87.5 |
| Maryland | 59.3 | 22.1 |
| Mississippi | 63.3 | 53.5 |
| New York | 199.8 | 19.7 |
| North Carolina | 158.7 | 44.5 |
| Ohio | 140.1 | 61.0 |
| Pennsylvania | 199.3 | 254.2 |
| South Carolina | 17.3 | 5.6 |
| Tennessee | 215.5 | 116.3 |
| Virginia | 153.2 | 37.6 |
| West Virginia | 268.1 | 140.3 |

*Includes prefinanced construction.

Question: A study a few years ago by Preston and Associates found that, simply on the basis of driving time lost, the construction cost of Appalachian highways could be recovered within five years. Conversely, what analysis do you have that economic development will blossom in Southern West Virginia without Corridor "G", for example?

Answer: We have no analysis on this subject.

Question: Would you provide for the record an estimate of how you would use $105,000,000, and $150,000,000 in FY 1988 if such funding levels were appropriated for Appalachian Regional development programs? Please provide this information by program and by state, to the extent possible.

Answer: The Appalachian Regional Commission's allocation policy provides for a proportional reduction in the amounts shown in the Governors' request to Congress for each program area in the event that appropriations are less than the amount requested except that the total amount allocated for non-highway purposes will not be less than $37.6 million. The following tables reflect the allocation of $105,000,000 and $150,000,000, respectively, among program areas and States.

## Questions Submitted by Senator Stennis

**Question:** The President's Budget proposes to eliminate funding for the Appalachian Regional programs and most other rural economic development programs. What do you see as the future of development in the Appalachian Region without these federal programs?

**Answer:** Many communities and states within the Region are doing quite well economically, by any standards. I believe they would continue to do so without the relatively small sums of program funds you're referring to. Other Appalachian states, including perhaps yours, Mr. Chairman, are not doing so well. I believe for these specific states which are not responding well to the general recovery and where state, local and private sector economic development funding is not up to the task, that currently available federal funds, such as HUD's CDBG to name but one, could be redirected and targeted to assist the most distressed communities and cases.

**Question:** The Appalachian Regional program has helped fund over 525 development projects in Mississippi alone during the past 20 years. Please give us some examples of the type of projects which have been funded with assistance from the Appalachian Program.

**Answer:** Some recent examples of area development projects are:

The Riverport project in Columbus, Mississippi. These funds will provide for the development of a riverport and industrial park located along the Tennessee Tombigbee Waterway.

In Putnam and Smith counties in Tennessee, ARC funds along with state funds allowed the purchase of a rail spur line. This rail line had been abandoned by a major railroad company but it provided service to 42 shippers. Prior to the formal decision to abandon, the local communities banded together and formed a railroad authority for the express purpose of purchasing and operating the railroad.

Another example is the ARC assistance in the construction of sewer and water service to serve the historic Pence Springs Resort in Summers County, West Virginia. The development of this facility is estimated to create 90 permanent jobs and 150 seasonal jobs. As a private investment in the project, the developer provided the local matching funds.

An example that we at ARC are very proud of is a small grant made to the Mountain Association for Community Economic Development (MACED) to support the efforts of a leadership development project in eastern Kentucky. This project will develop a permanent program for the Fifth District to increase the graduation rate and strengthen the area school systems. The goal is to provide local leadership as a vehicle for improving educational attainment and educational opportunities.

**Question:** Would many of these development projects have gone forward without assistance from the Appalachian Regional programs and without assistance from other federal economic development programs which the President's budget proposes to eliminate?

**Answer:** Most projects funded by ARC must show a demonstrated need for assistance in the project application documentation.

I am not in a position to judge whether these projects would have been funded by other sources such as state, local or private participation without ARC and other federal economic development programs.

## QUESTIONS SUBMITTED BY SENATOR SPECTER

Question: In your opening statement you indicated that the Appalachian Regional Commission (ARC) has accomplished its mission of placing Appalachia in a competitive stance with the rest of the country, therefore justifying the Administration's proposed termination of funding for the Commission. You have further testified that the development of healthier regional economies must include not only the maintenance and construction of physical infrastructure, but also the utilization of programs directed at the further strengthening of "Human Infrastructure" through education, re-training, and health programs. Economic indicators in the Pennsylvania Appalachian region reflect, however, that further application of ARC programs remain essential. For example, the 1986 average unemployment rate in the Pennsylvania Appalachian region was 8.5 percent, 1.5 percentage points higher than the national average. Furthermore, average per capita incomes in these areas have declined from their 1976 position at 94 percent of the national average to 87.3 percent of the 1984 national average. Please explain how the Pennsylvania Appalachian region is in the status which you have described given such adverse disproportionate economic indicators.

Answer: I do indeed believe that the Appalachian Regional Commission, created as a temporary agency twenty-two years ago, has basically achieved the purposes for which it was designed. Therefore, its support by taxpayers across the country, many of who are experiencing worse economic conditions than some Appalachians, including Pennsylvania Appalachians, can no longer be reasonably justified.

On the other hand, if the Commission is to continue, I strongly argue that federal investments in the human infrastructure of all Appalachia, as well as continued but limited construction and maintenance of its physical infrasturcture, will do far more over the long run to decrease unemployment rates and narrow per capita income gaps than any program which fails to address the health, educational, and leadership needs of the appalachian work force in any substantial way.

### SUBCOMMITTEE RECESS

Senator SASSER. We have a vote going on in the Senate now and both Senator Stennis and I are going to have to go answer that roll call. So, without objection, the committee will be in recess.

[Whereupon, at 11:50 a.m. Thursday, March 12, the subcommittee was recessed to reconvene at 2 p.m. the same day.]

# ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 1988

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MONDAY, MARCH 16, 1987

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
*Washington, DC.*

The subcommittee met at 2:07 p.m. in room SD–192, Dirksen Senate Office Building, Hon. J. Bennett Johnston (chairman) presiding.

Present: Johnston, Burdick, Sasser, McClure, and Domenici.

## DEPARTMENT OF THE INTERIOR

### BUREAU OF RECLAMATION

### STATEMENT OF HON. DONALD PAUL HODEL, SECRETARY OF THE INTERIOR

**ACCOMPANIED BY:**

- **C. DALE DUVALL, COMMISSIONER, BUREAU OF RECLAMATION**
- **ANTHONY L. ITTEILAG, DIRECTOR OF BUDGET**
- **WILLIAM C. KLOSTERMEYER, ASSISTANT COMMISSIONER, ADMINISTRATION, BUREAU OF RECLAMATION**

### INTRODUCTION OF WITNESSES

Senator JOHNSTON. The hearing will come to order. This afternoon, the committee continues hearings on the fiscal 1988 budget request for the federal energy and water development programs. Today, it is a pleasure to welcome back before this subcommittee Mr. Donald Paul Hodel, Secretary of the Interior, along with Commissioner Dale Duvall from the Bureau of Reclamation, and other members of their staffs.

Mr. Secretary, it is good to see you again and renew an association which goes back many years. I understand that both you and Commissioner Duvall have brief oral remarks on the budget request. If there is no objection, I propose to let the Secretary and Mr. Duvall make their opening remarks, after which we will open it up for questions.

I know you, of course, have prepared statements which we will put in the record following youor oral remarks. Please proceed as you wish.

Secretary HODEL. Thank you, Mr. Chairman. In addition to Mr. Duvall, we have with us Bill Klostermeyer, who is the Assistant Commissioner of Administration for the Bureau of Reclamation next to Mr. Duvall, and on my left is Tony Itteilag, who is the Department of the Interior Budget Officer.

### BUDGET OVERVIEW

The overall budget for the Department, Mr. Chairman, is down $280 million from the 1987 enacted level, but in that budget we attempted vigorously to maintain the operational integrity of the bureaus of the Department. We, in some cases, had to curtail capital construction and land acquisition-type proposals, but we attempted to maintain the operating level so that we could adequately take care of things that we have.

The Bureau of Reclamation has a modest divergence from that, because this year's proposal of $1,053,000,000 is actually a $98 million increase over the 1987 level of funding for the Bureau.

I need to emphasize, Mr. Chairman, that this Department, the Commissioner, and the administration support water projects. We believe that these water projects have been tremendously important to the West, and particularly to the locales where they have been utilized. We have supported them since the arrival of this administration. Again I emphasize that, because one of the proposals that I need to talk about briefly in this introduction is one which has been seen by some as a hostile or unfriendly act on my part toward water projects. It is not intended that way at all.

### REPRIORITIZATION OF 1988 BUDGET

In our construction budget, I became increasingly aware that we have had nearly 60 projects under construction for a number of years. In the past we have submitted a budget in which we basically ask for less money than is necessary to move those projects toward completion. The funds were then spread across all the projects, which prevents many of them from moving forward on an efficient schedule. It may take $30 million to move a project 15 percent toward completion. But because of the budget constraints, we may request $15 million, and instead of moving the project 7½ percent, which would be half of that 15 percent toward completion, what we actually do is not move it toward completion at all or move it forward 1 or 2 percent less, because much of the first chunk of the money is for nonconstruction activities. It is keeping people on the site, keeping equipment there, and making ongoing contractor payments, but not moving dirt, not pouring concrete, and not installing steel and making something happen on an optimal schedule.

So I asked the Bureau to list the projects in priority order, primarily based on the closest to completion. When we looked at the list, we then said, "Let's put the money on those projects closest to completion and try to finish something."

The result of that is a construction program which, if we were to go forward with the proposal, is best shown by a chart which, with your permission, I would like to make available to the members of the committee.

This chart, showing the construction program's long-range perspective, illustrates in the red bar the amounts of money needed to maintain the schedules for projects closest to completion. The blue portion represents the funding requirement for the projects which are under construction but are being delayed. The green portion of the chart represents monies which begin to become available in 1989 and beyond from projects being completed. These funds may be applied to the next lower priority projects, or those closest to completion.

The result of this is that by 1992 we actually begin to have some money available at the $650 million funding level, even for new starts. Maybe more importantly, we will be finishing some of these projects that have been going on for a long time. The problem, of course, is that in doing this, some of the projects which will be delayed are of great concern to Members of the Congress and to local constituent groups.

We have proposed a similar situation with regard to the general investigations portion of the Bureau's budget. Some time back I was asked if I thought the Bureau of Reclamation was entering a new era. This was a couple of years ago. I responded that I thought it had, in fact, entered a new era, because the era of very large projects may be behind us. Partly, many have been done. Other projects would have great difficulty getting approval because of environmental considerations, cost factors, and the like. Therefore, what I saw the Bureau needing to be able to do was complete the projects that it has under construction, operate and maintain the systems that have already been put in place, and utilize its experience and knowledge in such other productive areas as the Congress and the administration might be able to recommend. But that would leave us with a budget and with a planning staff geared up to the planning and design of very large and massive projects.

It seemed to me that the ongoing general investigations level was greater than we could justify. Therefore, we proposed cutting back. Actually, if our proposal presented in the fiscal year 1988 request were to be approved, we propose to begin making adjustments in 1987. The House committee has advised us that they would not concur in those changes, and I have a sense, Mr. Chairman, that several members of your committee would urge this committee to take exactly the same position.

So we have basically said we will not proceed in the general investigations area to gear down or to shut off those projects in fiscal year 1987 as a part of this budget proposal.

## KESTERSON RESERVOIR CLEANUP

Other issues are covered in the opening statement, Mr. Chairman. There is one last thing I need to mention. This week, we expect that the California State Water Resources Control Board may reach a decision with regard to the cleanup method that they will approve for the

Kesterson Reservoir. We have before the Congress a request for a supplemental appropriation of $5.6 million for what we call the wet flex cleanup method. This is the least costly method.

It permits us to immediately reduce toxic levels. It is somewhat controversial in that not everyone agrees that it is the right or the best way to go. It is my hope that the Water Resources Control Board would approve the wet flex method. This would permit us to go in there and begin improving the situation immediately. If we monitor it as closely as we plan to do, we will rapidly know whether additional cleanup will be necessary.

Senator JOHNSTON. What is the wet flex plan?

Secretary HODEL. I should probably ask the Commissioner to describe it. It is a matter of bringing additional fresh water in and reducing the selenium level proportionately.

Senator JOHNSTON. Of course, that is dilution.

Secretary HODEL. Yes; it may well be. The process is to trap the more heavily selenium-laden layers of water below the fresh water and minimize its access to wildlife and so on.

The concern I have is that the State Water Resources Control Board may opt for a much higher cost alternative and say that is all they will accept. I am fearful in that case it may become the battleground of litigation between irrigators and the state over whether that is required and who will pay for it. It may, in fact, slow down the cleanup, which I think would be unfortunate. I would like to see us approach the cleanup with the wet flex method and monitor progress closely. But I have to alert you, however, that I am fearful that the State Water Resources Control Board has received a different recommendation from their staff and may very well act on it. That could create some problems down the road, and maybe fairly soon.

With that, Mr. Chairman, I would be happy to try to respond to your questions.

[The statement follows:]

## STATEMENT OF SECRETARY DONALD HODEL

Mr. Chairman and Members of the Committee:

I am pleased to appear before you today in support of the President's FY 1988 budget for the Department of the Interior.

The mission of the Department of the Interior is carried out within the budgetary framework proposed annually to the Congress by the President. The measures in this budget reflect my continuing commitment to ensure that the Nation's public lands and natural resources are wisely used and protected for the economic and environmental well-being of the Nation and that essential services to the public are maintained.

### Department Totals

Before I discuss the elements of our request for the Bureau of Reclamation, I would like to provide you with some specifics on the budget request for the entire Department. The 1988 Interior Department budget totals $6.3 billion in budget authority, a decrease of $1 million from the current 1987 estimate. Outlays in 1988 are estimated to be $6.3 billion, a $660 million reduction below the 1987 estimate of $6.9 billion.

The 1988 budget for the Department of the Interior provides sufficient funding to meet the Department's many and varied operating priorities, while contributing to reduction of the deficit. Together with the other components of the President's budget, the Department's requested budget of $6.346 billion will achieve the 1988 deficit target established by P.L. 99-177, the Gramm-Rudman-Hollings Balanced Budget and Emergency Deficit Control Act, while maintaining the integrity of essential operating programs and the priorities of this Administration. To meet the target, the budget also proposes net reductions (including rescission proposals partially offset by supplemental requests) of $280 million below the 1987 enacted level.

### Bureau of Reclamation

The 1988 budget estimate for current and permanent appropriations for the Bureau of Reclamation is $1.053 billion, an increase of $99.7 million compared to the 1987 appropriation and 1987 current estimate of $953.5 million. The 1988 estimate includes $8.2 million for increased pay costs and $17.1 million for costs of the new Federal Employee Retirement System. The 1988 estimate for accounts subject to appropriation is $949.1 million, an increase of $81.5 million over the 1987 estimate of $867.6 million.

This Administration and this Department, where I have served as both Under Secretary and Secretary, have been wholly supportive of water resource development. We believe in the importance of water to the West. We have demonstrated these beliefs by consistently supporting increased spending levels for water project construction within the constraints of overall fiscal policy.

Consistent with these beliefs, our 1988 budget proposes to concentrate financial resources on construction projects and planning studies that are substantially underway while constraining funding for new planning projects and construction projects further from completion. This approach will establish a more efficient schedule for completion of many projects and will allow available funding in future years to be applied to postponed projects and planning studies.

### Construction Program

The budget requests new funding of $700.2 million for Bureau of Reclamation construction projects, an increase of $98 million over the 1987 estimate. The increase is required to finance features of projects in which the Federal government has a major commitment. Increased funding is also provided to meet increased pay and retirement costs. At the same time, the request reflects a major new policy shift aimed at completing construction projects substantially underway while postponing or constraining funds for projects in the earlier stages of construction. Historically, numerous projects have competed for limited funds, thus stretching the completion dates on many of them. In order to help achieve the Gramm-Rudman-Hollings deficit elimination goal by 1991, the Bureau's budget will remain restrained in future years. Such restraints will not permit funding levels sufficient to keep all projects on the most efficient schedules.

Rather than uniformly reduce the funding for all projects or terminate projects in which there have already been substantial Federal financial investments, the Bureau has reviewed its entire Construction Program to identify those projects or features of projects that can be brought to completion more expeditiously. In 1988, the Bureau is proposing to concentrate its resources to expedite construction of certain projects while limiting or postponing funding for others. As work is completed on an expedited basis, the Bureau plans to return in the future to projects that have been delayed.

As a result of this effort, the Bureau will be able to complete more projects or major features than would have been possible if available funding had been distributed to all projects, regardless of their relative stages of completion.

Within this framework, projected Central Arizona Project (CAP) funding for 1989-1992 is adequate to meet construction schedules established in the cost sharing agreement for Plan 6. In addition, projected Central Utah Project (CUP) funding for 1989-1992 is sufficient to maintain the CUP on schedule.

While no new construction starts are proposed for 1988, this request provides for construction activities on 58 ongoing projects. In accordance with the policy set forth above, the Central Arizona Project (CAP) will be funded at $268.7 million, an increase of $64.8 million, the Bonneville Unit of the Central Utah Project will be funded at $134.5 million, an increase of $50.7 million, and the Safety of Dams Program at $62.9 million, an increase of $23.9 over 1987 levels. The concentration of resources on these and other projects will of necessity result in decreased funding for other projects even though the total construction request is $98 million over the 1987 estimate.

## Planning and Research

The 1988 request for General Investigations (planning and research) is $11.6 million, a $17.8 million decrease from the 1987 current estimate of $29.4 million. This reduction supports the policy of concentrating available resources on projects substantially underway. No funds are proposed for initiating new planning studies. Our recommendations for the planning program are intended to effect earlier completion of those studies currently well underway, coordination of planning studies with the funding levels and capabilities within the Construction Program, and consistency with non-Federal cost sharing goals related to planning and construction. The Department does not wish to compound existing construction project funding difficulties by planning for additional projects which would then compete for limited construction resources with projects not yet completed.

With regard to Bureau planning activities, our FY 1988 proposal is dependent upon taking action in FY 1987. We proposed postponing some planning studies and research in order to make sufficient funds available to meet termination and relocation costs associated with reducing staff. Our goal was to gain concurrence of both Appropriations Committees on these actions. At our recent hearing before the House, the Committee indicated it did not support our proposal to reallocate planning funds in FY 1987. In the absence of House Committee approval to do otherwise, we are carrying out the planning program as set forth in the FY 1987 Appropriations Act. However, this will have an effect on the FY 1988 budget for the General Investigations Program. If we are to have a more efficient planning effort, which I believe is necessary, there will be one-time costs in FY 1988 which we had proposed to incur in FY 1987. We will work with the Committee staff to keep you fully informed as to these costs and their effect on our FY 1988 budget proposal.

Let me assure you that my intent is not to abandon the planning function. On the contrary, I believe our proposal will strengthen the planning program over the long run by placing the Bureau in a position of planning projects on a timely basis, and then starting and completing them on optimum construction schedules.

## Loan Program

The request for the Loan Program is $28.8 million, a decrease of $8.7 million from the 1987 current estimate of $37.5 million. The budget request for loans has been decreased to provide additional resources to the Construction Program for projects substantially underway. Work will continue on 11 projects, 7 of which will be completed in 1988. No new loan starts are proposed in 1988. The Administration proposes to sell the portfolio of all completed loans as part of its government-wide asset sales initiative. This sale is estimated to result in revenue of $154 million in 1988, thus favorably affecting the Federal deficit.

## Operation and Maintenance

The 1988 request for Operation and Maintenance is $154.3 million, a $14.3 million increase above the current 1987 estimate, for activities on 36 reclamation projects, as well as the Bureau's associated water resources management activities. The proposed level of funding will provide sufficient resources for a reliable operation and preventative maintenance program which is essential as Bureau facilities become older.

## Other

The budget request includes $53.3 million, an increase of $2.1 million over the 1987 current estimate, for General Administrative Expenses to help cover increased pay and retirement costs. The request for the Emergency Fund is $1 million, the same amount appropriated in 1987. An amount of $287,000 is required for permanent appropriations. The budget projects that non-Federal contributions to Reclamation Trust Funds will amount to $48 million, reflecting increased cost sharing for Bureau projects. In addition, the Bureau will continue to support many of its cooperative activities through reimbursements, such as the Foreign Activities Program, which now provides assistance in 12 countries.

## Kesterson Reservoir 1987 Supplemental

The budget includes a 1987 supplemental request to transfer $5.6 million from unobligated balances in the Loan Program to initiate cleanup activities at the Kesterson Reservoir and the San Luis Drain in accordance with the plan submitted to the California State Water Resources Control Board on December 1, 1986. The Administration will propose, if necessary, legislation to cover repayment of Kesterson Reservoir and San Luis Drain studies and cleanup activities, and San Joaquin Valley Drainage studies.

## Conclusion

In conclusion, Mr. Chairman, I believe this is a good budget and it will provide us with a real opportunity to improve the way in which we are carrying out our responsibilities to support water development in the West. Our concept of concentrating construction activities on those projects substantially underway or those which meet critical needs, is a rational and responsible way to proceed. Let me assure you that we are committed to water resource development, and we are trying to see to it that these projects begin to produce their benefits in a more timely and efficient manner.

I will be happy to answer any questions you have at this time.

## REMARKS OF C. DALE DUVALL, COMMISSIONER, BUREAU OF RECLAMATION

### REPRIORITIZATION OF 1988 BUDGET

Senator JOHNSTON. Thank you very much, Mr. Secretary.

Why don't we hear first from Mr. Duvall, and then we will take questions.

Mr. DUVALL. Thank you, Mr. Chairman. I have a prepared statement that I trust the committee will enter into the record. I would like to reemphasize two or three points relative to the reordering or reprioritization of our budget proposal for 1988. Emphasis should be placed on the fact that we are not proposing to cancel or abandon any projects. Rather, we are simply recommending a change in the way we allocate the funding within the construction program. The proposed new policy aims toward a construction program which will optimally fund each active project. New projects would not be funded until sufficient funds become available for them to proceed on an optimal schedule.

This policy would concentrate regional and project office expenditures and activities, and reduce noncontract and administrative costs. The resulting efficiency would increase the portion of the appropriated resources that are expended on actual on-site construction. It will reduce the final project costs and provide earlier project benefits at a lower cost.

The budget also proposes needed restructuring in the planning organization, and as the Secretary indicated, the House committee has indicated some concern with that proposal. We are pursuing that on a day-by-day basis at the moment. We want to make it clear that it is not now, nor was it ever, our intent to abandon the planning function. On the contrary, we believe our proposal will strengthen the planning function over the years by placing the Bureau in a more competitive position for planning worthwhile projects on a timely basis. Once a project is started, it will be completed on optimum construction schedules while the economics of the project are still there.

### CONSTRUCTION PROGRAM

There are a couple of other points I would like to make. In the construction program, we are recommending a substantial decrease for what is called the undistributed reduction based on anticipated delays, commonly referred to as underfinancing. The underfinancing estimate reduces the total amount available to fund scheduled work. In the past, we have had large carryover balances that could justify the high underfinancing rates for the construction program. However, at the end of fiscal year 1986, we had obligated all but $7 million of our construction funds. At this time, we see no fiscal year 1987 carryover funds available in fiscal year 1988. Due to the disappearance of carryover funds, any additional amount of underfinancing over the request will force delays in our scheduled program.

## OPERATION AND MAINTENANCE PROGRAM

A word about the operation and maintenance program. Our budget proposal for fiscal year 1988 includes an increase of $14.3 million for operation and maintenance. That increase includes funds of $4 million for the operations in accordance with the Ak-Chin water rights settlement and $8.1 million for the pay raise and retirement costs.

I would further point out that almost 81 percent of project operation and maintenance costs are reimbursable in the year they are incurred. Consequently, reductions or transfers to other line items from the operation and maintenance line item only defer needed maintenance. It impairs aging facilities while reducing net costs by only 19 cents on the dollar.

## CONCLUSION

In closing, let me repeat that our proposal is markedly different than in past years because we are recommending concentrating construction activities on those projects substantially underway or those which meet critical needs, such as safety of dams.

Given the budget deficit situation, maintaining the optimum construction schedule for all projects is impossible. In later years, as funds become available, construction will be resumed on postponed projects.

But let me emphasize again, this fiscal year 1988 proposal does not cancel or abandon any construction projects or planning studies.

Thank you, Mr. Chairman.

[The statement follows:]

## STATEMENT OF COMMISSIONER C. DALE DUVALL

Thank you Mr. Chairman, for the opportunity to appear before you and the committee today to discuss the proposed fiscal year 1988 budget for the Bureau of Reclamation.

The President's fiscal year 1988 budget for the Bureau reflects the Administration's continuing commitment to water resource development and conservation in the West. The budget request for current and permanent appropriations is $1.053 billion, an increase of $99.7 million compared to the FY 1987 level of $953.5 million. Funding has also been provided to meet increased pay and retirement costs.

We are requesting funding of $700.2 million for Bureau of Reclamation construction projects, an increase of $98 million over the FY 1987 appropriation. The budget request for FY 1988 reflects a major new policy proposal designed to complete construction projects or features substantially underway while constraining funds for projects in the early stages of construction. As work is completed on those projects substantially underway, the Bureau would then return to projects that had been postponed earlier.

Historically, numerous projects have competed for limited funds, thus stretching out completion dates on many of them. In order to help achieve the Gramm-Rudman-Hollings deficit elimination goals by 1991, we expect the Bureau's budget to remain restrained in future years. Such restraints will not permit sufficient funding levels to keep all projects on efficient schedules. Rather than uniformly reduce the funding for all projects or terminate projects in which there has already been a substantial Federal financial investment, the Bureau has identified those projects or features of projects that can, with increased funding, be brought to completion on the most efficient construction schedule.

Let me re-emphasize that we are not cancelling or abandoning any projects. We are simply recommending a change in the way we allocate funding within the Construction Program. Using the funding projections developed by the Office of Management and Budget for the next five years, we estimate that in 1989 there will be over $200 million available for work on these delayed projects to include restarting some. If this funding approach is adopted and continued, projects will be completed and their benefits made available on a more efficient schedule. By 1992, nearly $400 million would be available within the projected ceiling to fund all delayed projects at their optimum level, and still leave as much as $100 million to initiate new projects and features not presently scheduled for construction.

The proposed new policy aims toward a construction program which optimally funds each active project within the constraints of overall fiscal policy. New projects would not be initiated until sufficient funds become available to fund them on an optimal schedule. This policy would help the Bureau concentrate regional and project office staff activities and reduce administrative costs. The resultant efficiency would increase the portion of appropriated resources that are expended on actual contract costs, reduce the final project cost, and provide project benefits earlier and at a lower cost.

The budget proposes $11.6 million for the General Investigations Program for planning and research, a decrease of $17.8 million from the 1987 appropriation. This reduction reflects a needed restructuring of the planning organization that is proposed in order to begin reducing the number of water projects currently competing for limited construction funding. We do not wish to compound existing construction project funding difficulties by planning for additional projects which would then compete for limited resources; nor do we think it prudent to plan projects which must be held on the shelf before efficient construction could commence.

No funds are proposed for initiating new planning studies. Our recommendations for the planning program are intended to permit completion of those studies that can be completed in FY 1987 or FY 1988, coordinate planning studies with the projected funding levels and capabilities within the Construction Program, and ensure consistency with non-Federal cost sharing goals related to planning and construction. Within those guidelines, we will continue planning activities on worthwhile studies that have been or will be authorized by Congress. Such ongoing planning activity is necessary in order to position worthwhile projects for construction starts in the outyears, 1991 and beyond, when resources once again become available within the established ceiling targets.

Part of our FY 1988 budget proposal, especially with respect to General Investigations, is dependent upon taking actions in FY 1987 to reduce staffing levels. Our plan was to gain concurrence of both committees for these actions. At our recent hearing, the House Committee indicated that they expected us to follow the program called for in the FY 1987 Apppropriations Act. In the absence of House and Senate Committee approval to do otherwise, this is now our plan of action. However, this will have an effect on the FY 1988 budget for General Investigations. If we are to have a more efficient planning effort, which both the Secretary and I believe is necessary, there will be one-time costs which we had planned to incur in FY 1987. We will work with the Committee staffs to keep you fully informed of these costs and their effect on our FY 1988 budget.

I want to make clear that there is no intent to abandon the planning function. On the contrary, we believe our proposal will strengthen the planning function over the long run by placing the Bureau in a position of more efficiently planning worthwhile projects on a timely basis and then starting and completing them on optimum construction schedules.

Before continuing to describe the budget in detail, let me take a few moments to mention some of the significant activities that have taken place during the past year.

The Bureau obligated 99 percent and expended 95 percent of its available construction funds in 1986, compared to a rate of 89 percent and 75 percent, respectively, in 1985. These are the highest accomplishment rates we have had in 10 years. This virtually eliminated the amount of carryover funds available in FY 1987. With this increased emphasis on program accomplishment, we anticipate a negligible amount of unexpended funds at the end of FY 1987. Such emphasis confirms the necessity of having a fiscal year 1988 appropriation for the Construction Program in accordance with the President's budget request.

In the Construction Program, we are recommending a substantial decrease of approximately 50 percent for the undistributed reduction based on anticipated delays, commonly called "underfinancing". The underfinancing estimate reduces the total amount available to fund scheduled work. The large carryover balances of the past could justify the high underfinancing rates for the Construction Program. However, at the end of FY 1986 we had obligated all but $7 million in the Construction Program. At this time we see no indication that there will be any carryover funds available in FY 1988. Because of the virtual disappearance of carryover funds, any additional amount of underfinancing will force delays in our 1988 scheduled program due to budget constraints. Therefore, we recommend $40.8 million as an undistributed reduction for underfinancing in FY 1988 as compared to $73.3 million for the Construction Program in FY 1987.

In 1986 the State of California and the Bureau of Reclamation entered into a water agreement that signaled a new era in Federal and State cooperation. The Coordinated Operating Agreement, signed into law by President Reagan last October, spells out how the State and Federal water projects can be operated jointly to meet foreseeable California needs for additional water supplies while protecting the environmentally fragile Sacramento-San Joaquin Delta and San Francisco Bay. We are very pleased with that accomplishment.

Regarding the Reclamation Reform Act, we are now reviewing the comments received following publication of the draft rules that were proposed to implement the law. You may recall that the comment period had been extended 30 days to February 5, 1987. The proposed rules are particularly important with regard to Section 203(b) of the Reclamation Reform Act, which takes effect April 12, 1987. This section requires individuals leasing land to pay full cost for water supplied to lands under previous Reclamation law in excess of 160 acres, and to lands under the 1982 Reclamation Reform Act in excess of 960 acres. Sixteen public hearings were held late last year to hear comments on the proposed rules. We are in the process of incorporating those comments with our proposals in preparation of the final rules.

The budget includes a FY 1987 supplemental request to transfer $5.6 million from unobligated balances in the Loan Program. This will pay for initial cleanup activities at the Kesterson Reservoir and the San Luis Drain in accordance with the plan submitted to the California State Water Resources Control Board on December 1, 1986. The plan calls for a phased approach to the cleanup of Kesterson Reservior. During March the State board is scheduled to issue a final decision on the cleanup plan. Quick action is needed on the supplemental request as the cleanup work needs to start in April in order to meet the State's completion deadline of February 1988.

We are also continuing to work with other Federal and State agencies involved in the San Joaquin Valley Drainage Program. The study was initiated in 1984 to investigate and identify agricultural drainage problems in the Valley and recommend appropriate action. If necessary, the Administration will propose legislation to cover repayment of Kesterson Reservoir and San Luis Drain study and cleanup costs, and San Joaquin Valley drainage study costs.

I would now like to turn to some particular highlights of our fiscal year 1988 appropriations request. With respect to Construction Program allocations, it should be noted that the following comments relate to gross amounts and do not reflect any allocation of the $40.8 million of "underfinancing" mentioned earlier.

Our proposal allocates $268.7 million for the Central Arizona Project (CAP) including the Non-Indian Distribution Systems. In accordance with our proposal to expedite the completion of projects that are well underway, we have applied additional funding to the CAP. Projected CAP funding for 1988-1992 will be adequate to meet construction schedules established in the cost sharing agreement for Plan 6 agreed to by the Secretary of the Interior.

Construction will be completed on the cutoff wall for New Waddell Dam, the first section of the Waddell Canal to the New Waddell Dam, Reach 4 of the

Tucson Aqueduct, and the Ak-Chin On-Reservation distribution system. Other work will continue on the New Waddell Dam, the Tucson Aqueduct and associated pumping plants, transmission facilities, regulatory storage, and on features for the modified Roosevelt Dam. Construction will also continue on five Indian and six non-Indian distribution systems and on one joint-use main delivery canal.

The proposal calls for $134.5 million for the Bonneville Unit of the Central Utah Project. Construction will be completed on Stage II of Upper Stillwater Dam, Doc's Diversion Dam and Feeder Pipeline, Rhodes Diversion Dam and Win Stream Inlet, and relocation of powerlines at Jordanelle Dam. This will complete the Strawberry Aqueduct and Collection System. Work will continue on the Duchesne Area Canal System rehabilitation and the Jordanelle Dam. These funds and the projected outyear funding will be sufficient to maintain the CUP schedule.

A request of $36 million is being made for Central Valley Project activities in California. Funds provide for continuing work at the San Luis Canal joint use facilities. San Joaquin Valley drainage studies related to the selenium found in drainage waters and in Kesterson Reservoir will be continued, as well as cleanup and closure activities at Kesterson Reservoir and San Luis Drain. On the San Felipe Division, contracts will be awarded for transfer stipulations required prior to turning project facilities over to the water districts for operation.

Work on the Columbia Basin Project in Washington will require $28 million in FY 1988. With this funding, drainage construction on the Irrigation Facilities and riverbank stabilization below the Third Powerplant will continue, and modifications to the powerplant will be made.

The amount of $44 million is requested for the Colorado River Salinity Control Projects. Approximately $24 million of that total is being requested for Title I activities including work on the Yuma Desalting Plant and related facilities. Under Title II of the program, approximately $11.4 million is allocated for the Paradox Valley Unit in Colorado to continue construction of the injection well. Approximately $8.5 million is programmed for the Grand Valley Unit, also in Colorado. Construction will be completed on the West Government Highline Canal while cooperative agreements for land acquisition will be pursued.

In New Mexico, construction of Brantley Dam and the acquisition of land will continue. The request of $23 million will also fund the breaching of McMillan Dam which Brantley replaces, and fish and wildlife habitat development.

In North Dakota, funds amounting to $2.5 million will provide maintenance for site security and safety of facilities at the Garrison Diversion Unit. We are assessing current resources for capability to complete both the New Rockford Canal, Reach 1A, and the Oakes Test Area.

Work is to continue on the modification of Buffalo Bill Dam in Wyoming. The proposed $11.7 million will also provide funds to continue the modification of the Shoshone Canyon Conduit and to complete the contracts on the powerplant and North Fork Dike.

The $17.3 million allocated to the Headgate Rock Hydroelectric Project in Arizona will allow work to continue on the construction of the powerplant and transmission lines. The funds will also be used for the procurement of turbines, generators and auxiliary equipment.

Funding of $8.5 million for the Dallas Creek Project in Colorado will provide for completion and minor work on Ridgeway Dam and reservoir. The reservoir continues to fill. Also in Colorado, $11 million is earmarked for the Dolores Project. Work on the South Canal will be completed while contracts will be awarded for the Pleasant View-Ruin Canyon-Hovenweep Pumping Plants and Laterals. Preconstruction activities will continue on McPhee Dam Powerplant features, Dove Creek Canal, and Cortez-Towaoc distribution systems.

One of the newest projects in the Reclamation program is the Animas-La Plata Project in southwestern Colorado. The proposed budget has almost $2 million for preconstruction activities on Ridges Basin Dam, cultural resource mitigation, and purchase of laboratory and office equipment. The Animas-La Plata Project is an example of the Administration's policy to negotiate for increasing local cost-sharing for the construction of major water projects. The activities on this project also provide an opportunity to settle long-standing Indian water claims in the region.

The McGee Creek Project in Oklahoma will become operational this year with $8.3 million in FY 1988 funds required to continue construction of access roads and to acquire mineral interests. The project will provide supplemental municipal and industrial water for Oklahoma City and surrounding communities.

In Texas, the Bureau constructed the Palmetto Bend Project to provide a dependable municipal and industrial water supply for the coastal plains area. Funds amounting to $700,000 in fiscal year 1988 are required to complete drain rehabilitation and electrical modifications.

In the area of Safety of Dams, the proposed budget for fiscal year 1988 calls for the continuation of rehabilitation work on Fontenelle Dam in Wyoming. The $19.5 million allocation includes the work required to remedy seepage flows and foundation settlement. Funds of $24.9 million will be used to continue construction work to stabilize Jackson Lake Dam by strengthening the embankment and foundation materials.

The fiscal year 1988 Safety of Dams program totals $62.9 million, which includes conducting corrective action studies and final designs on several dams. Modification work will be completed on Pactola Dam and spillway in South Dakota. In addition to the work on Fontenelle Dam and Jackson Lake Dam, construction will also continue on Altus Dam in Oklahoma, Newton Dam in Utah, and Lake Tahoe Dam in California. Construction is scheduled to start on Stewart Mountain Dam in Arizona. Corrective work will be initiated on Bradbury Dam, Cachuma Project, and on O'Neill Dam in the Central Valley Project.

Preconstruction work, including design work, will continue on Little Panoche and Los Banos dams on the Central Valley Project in California, Casitas Dam also in California, and Stewart Mountain Dam, Salt River Project, in Arizona. The Bureau's Safety of Dams program also includes assistance on a reimbursable basis to other Interior agencies to develop and accomplish their dam safety programs.

The fiscal year 1988 appropriation request for the Bureau's Operation and Maintenance activities is $154.3 million, an increase of $14.3 million above the FY 1987 appropriation. The increase includes funds of $4 million for operations in accordance with the Ak-Chin water rights settlement and $8.1 million for increased pay raise and retirement costs. In FY 1988, 36 projects will be operated and maintained either entirely by Reclamation or in conjunction with water user organizations.

Almost 81 percent of the total cost of project operations and maintenance is reimbursable, in the year incurred, to the Federal Treasury through the sale of electric energy, irrigation, and municipal and industrial water.

Non-reimbursable O&M items include costs for flood control, fish and wildlife mitigation efforts, and most recreation activities. Completed water service facilities are normally transferred to local water user organizations for operation and maintenance as soon as they are able to assume those responsibilities.

The request includes funds for the Bureau's associated water resources management programs. They include administration of the Reclamation Reform Act, Examination of Existing Structures involving the investigation of Reclamation dams for safety, Soil and Moisture Conservation, Land Resources Management, and other related activities.

The Loan Program is an essential element of the Bureau's program because the size and complexity of most projects are beyond the financial resources of local entities. The request for the Bureau's Loan Program in FY 1988 is $28.8 million, a decrease of $8.7 million from the current FY 1987 estimate. The decrease in the budget request occurs because no new loan starts are proposed in FY 1988 in order to provide additional resources for projects substantially underway in the Construction Program. However, this funding level will maintain the schedule on all eleven loans in the program, seven of which will be completed in 1988.

The Administration also proposes to sell the existing portfolio of all completed loans as part of its government-wide asset sales initiative. Revenue from this sale, estimated to be $154 million, will help meet the FY 1988 deficit reduction target.

In closing, let me repeat that our proposal is markedly different than in past years because of our different concept in budgeting. That is, we recommend concentrating construction activities on those projects substantially underway, or those which meet critical needs, such as safety of dams. Given the budget deficit situation, maintaining the optimum construction schedule for all projects is impossible. In later years, as funds become available, construction will be resumed on postponed projects. But let me emphasize again, this FY 1988 proposal does not cancel or abandon any construction project or planning study.

I trust you will look favorably on this program approach and the Bureau of Reclamation budget proposal for fiscal year 1988. That concludes my presentation and I invite any questions you may have.

## GARRISON DIVERSION UNIT, NORTH DAKOTA

Senator JOHNSTON. Thank you very much, Mr. Duvall.

First of all, let me say to both of you that I think we very much like your new plan of speeding up some projects. We don't like, however, the other part of the proposal; namely, the slowing down the others. [Laughter.]

I am not trying to steal Senator Burdick's thunder. [Laughter.]

But I am sure that he will not object to my saying that this committee has had a long-term commitment to the Garrison diversion unit. We did not realize what a good project it was until some years ago when Senator Burdick explained that to us. [Laughter.]

As you know, there was a special commission chaired by former Louisiana Governor Dave Treen, a very careful, conservative, balanced person who came up with, I thought, a modest but liveable proposal, and the Congress authorized the reformulated Garrison project. We really feel, I think, speaking for certainly myself and, I think, most, maybe all the members of the committee, an obligation to go forward with the Garrison Diversion Unit.

I know it is an expensive project, but we have got to find the money for the project. I don't know exactly where it is going to come from. But we have got to find the money.

What would be the Bureau's capability on the Garrison project in the next 2 or 3 years?

Mr. DUVALL. If we had optimum funding, Mr. Chairman, we would have a capability of $40 to $45 million per year.

Senator JOHNSTON. You are almost too capable. [Laughter.]

Mr. DUVALL. That, as you understand, has been the problem of the Bureau's budget down through the years. We have been more capable than we have had dollars to expend.

Senator JOHNSTON. I don't want to get too deeply into that. We do feel a commitment to go ahead with that project.

### LOAN PROGRAM

Now, I note that the administration is not requesting funds to finance any new loans for fiscal year 1988 under the Small Reclamation Projects Act of 1956.

Are there any loan applications presently pending before the Bureau that would be eligible for funding if funds were made available?

Mr. DUVALL. Yes, Mr. Chairman. We have four loan applications at this time that could be funded were funds available.

### AVAILABILITY OF FUTURE CONSTRUCTION FUNDING

Senator JOHNSTON. Back on this construction program, we like the idea that these funds are available. What assurance would we have, if we follow this proposed program restructuring, that funds would be made available in future years?

Secretary HODEL. Mr. Chairman, that is a question that goes right to the heart of the issue as far as the future is concerned. The best assurance I have is two things: First, that it is what the out-year budget of the Office of Management and Budget projects; and second, to the extent we are able to work out with the Congress, an allocation along these lines would permit us to start finishing projects. It seems to me a very strong position can be taken by those projects that are further down the line; that they can look to this level of funding.

If I can put it another way. If we had gone on with business as usual, we would have projected a $31.6 million expenditure on Garrison—$33 million appropriated, less $1.4 million underfinancing. As often happens during the course of the year, we found ourselves moving more rapidly on another project and running into financial trouble. Therefore, we may very well have backed money out of the Garrison project, even though the $31.6 million may be the optimal funding level.

The reality of the Office of Management and Budget projections is if we do continue business as usual, we will need at least $650 million in 1991 and beyond in order to keep these 60 projects under construction even though none of them are really getting finished.

So, it would seem to me there is an opportunity here to make the point that we will take essentially the same number of dollars, but we will begin to see things get finished. We will have money available to complete those other projects. But your question is correct that there is no other assurance that I am aware of that funds would be available.

Mr. DUVALL. I might add one other point, if I might, and that is that if the Bureau can reorder and accelerate completion of active projects, then those projects are going to provide more positive economic benefits to the communities that they were built to serve.

Hopefully, with that improved economic picture from the standpoint of cost savings in the finished project, we will be standing in a little better stead with those people who might be detractors from the Bureau program. Consequently, it would be easier for us to justify the continued existence of the construction and planning activities.

Senator JOHNSTON. Thank you.

Senator Burdick?

## GARRISON DIVERSION UNIT, NORTH DAKOTA

Senator BURDICK. Thank you, Mr. Chairman.

Now, when the Garrison Diversion Reformulation Act was enacted just a year ago, and as you know, I was ultimately involved with that legislation, we were assured by officials of your Department that the reformulated project would have all-out support and that it could, again, after interminable delays, proceed at an optimum pace.

After those assurances, which, I might add, prompted us to accept some rather distasteful compromises, we now find that through your fiscal year 1988 budget you propose to cut us loose.

I guess I would have to say that the most heartening aspect of your testimony here today is your assurance that you desire to work with the committee to develop a program for fiscal year 1988, a program which may be somewhat different from that which you have proposed.

I can assure you that as far as this Senator is concerned, there will be some substantial changes and modifications in your proposal. Equally disheartening, and of more immediate concern, is the reprogramming of fiscal 1987 funds to, in effect, give you a head start on your 1988 plan.

What was appropriated for the Garrison Diversion Unit in fiscal 1987? Do you remember how much that was?

Mr. DUVALL. For 1987?

Senator BURDICK. Yes; for 1987.

Mr. DUVALL. About $33 million.

Senator BURDICK. How much of those funds have been spent or allocated and how have they been spent or allocated?

Mr. DUVALL. I would have to check those numbers and submit it for the record.

Senator BURDICK. It would be fine if you would supply that for the record.

Mr. DUVALL. We will do that.

[The information follows:]

### GARRISON DIVERSION UNIT FISCAL YEAR 1987 OBLIGATIONS

An amount of $33 million was appropriated for the Garrison diversion unit in fiscal year 1987. As of February 28, 1987, an amount of $19.1 million has been obligated as follows:

| | |
|---|---|
| Project office personnel | $1,951,000 |
| Regional office | 781,000 |
| E&R center | 257,000 |
| Miscellaneous noncontract costs | 418,000 |
| Rights-of-way | 216,000 |
| State MR&I | 6,200,000 |
| Service contracts and other agency costs for preconstruction work and comprehensive studies | 2,987,000 |
| Oakes distribution system construction | 650,000 |
| New Rockford Canal construction | 2,550,000 |
| Miscellaneous construction contracts | 612,000 |
| Wetlands trust | 2,500,000 |
| Total | 19,122,000 |

Senator BURDICK. What is your current balance in the Garrison account, and without reprogramming, how will those funds be spent during the balance of the fiscal year?

Mr. DUVALL. I will submit that for the record, if I may.

Senator BURDICK. How much of the current balance are you considering reprogramming, and where would it be spent?

Mr. ITTEILAG. Senator Burdick, that amount is $3 million, $3,045,000, to be exact.

Senator BURDICK. That is the firm balance?

Mr. ITTEILAG. No; that is the amount proposed for reprogramming.

Senator BURDICK. I see. How much is in the total balance?

Mr. ITTEILAG. I think, Mr. Burdick, that is the figure we have to provide for the record.

[The information follows:]

### Garrison Diversion Unit Balance for Remainder of Fiscal Year 1987

The current balance in the Garrison account is $12.654 million which accommodates $1.314 million assigned to underfinancing. The balance is estimated to be used as follows if no reprogramming occurs:

| | |
|---|---|
| Project office personnel | $2,730,000 |
| Regional office | 950,000 |
| E&R center | 570,000 |
| Miscellaneous noncontract costs | 439,000 |
| State MR&I water | 3,000,000 |
| Service contracts and other agency costs for preconstruction work and comprehensive studies | 490,000 |
| Construction to make Oakes test area operational | 2,000,000 |
| Purchase recreation lands, Devils Lake | 475,000 |
| Acquire Painted Woods Lake floodplain | 550,000 |
| Construct Lake Holmes outlet | 750,000 |
| Fish and wildlife mitigation and enhancement | 610,000 |
| Total | 12,564,000 |

An amount of $3.045 million is pending transfer to Fontenelle Dam, Wyo. The reprogramming was submitted to the Committees on Appropriations on March 13, 1987.

### EMPLOYMENT IMPACT

Senator Burdick. Is it enough to pay for the salaries and the lights and the heat?

Mr. Duvall. The remaining number?

Senator Burdick. The mark.

Mr. Duvall. Yes; we plan to secure the project with funds that remain.

Senator Burdick. Three million dollars firm so you can consider reprogramming. Where would it be spent? Such an action effectively closes out the Garrison account, does it not?

Mr. Duvall. No; there is about $2.5 million left of discretionary spending available to us in this fiscal year.

Senator Burdick. Can you maintain the staff and all the expenses of the Bismarck office for $2.5 million?

Mr. Duvall. That is after providing for the retention of staff. Our budget proposal identifies a significant shift in the staffing level at the Bismarck office.

Senator Burdick. A shift from where to where?

Mr. Duvall. Our current proposal is a shift from about 150 employees over a 2-year period of time down to about 50 employees as the James River studies are completed. In light of the reordering that we are doing on these projects and shifting our priorities, we are expecting to go out to a private sector construction management firm to take over the construction management of this project so we don't have to rehire the employees that we are talking about reducing from the staff at this point.

Senator Burdick. You mean to tell me that in the Bismarck office you are reducing the staff from 250——

Mr. DUVALL. From 150.

Senator BURDICK [continuing]. From 150 to 50?

Mr. DUVALL. To 50 over a 2-year period.

Senator BURDICK. When you restart the project, that isn't going to be adequate, is it?

Mr. DUVALL. No; that is why we would go to a private sector construction management contract for the construction site supervision, to avoid having to replace those people.

Senator BURDICK. Has that contract been executed or talked about?

Mr. DUVALL. It has been talked about, but it hasn't been executed.

Senator BURDICK. That is really trimming an office down to a minimum amount, isn't it?

Mr. DUVALL. That is correct. The office for Garrison has been carrying about 150 people for many, many years, and they really have not been effectively employed. The reason is because each year, we keep them because we hope that next year there will be enough work to keep them effectively employed.

Senator BURDICK. Can you effectively carry on the Garrison project and do the work that you should do with 50 people?

Mr. DUVALL. After the James River studies are completed, that is what our planning analysis shows that we will need to carry on.

Senator BURDICK. You can do that without the 150 that you have had for several years?

Mr. DUVALL. If we contract out the construction management.

Senator BURDICK. You could have substantially completed the Oakes test with the 1987 funds; is that correct?

Mr. DUVALL. That is correct. We are reordering funds in this year's budget in order to complete the Oakes test area.

### CRITERIA FOR PROJECT SELECTION

Senator BURDICK. Going back to your selection of projects, I understand the criteria used in selecting those projects was to select those which were farthest along and involved issues you wanted resolved at the earliest possible time or involved Indian rights.

Mr. Secretary, the Garrison project, has been on the books longer than, I dare say, any of the others with the possibility of one exception. A very substantial portion of the principal supply works is completed, and one area, the Oakes test area, must be completed to answer questions related to the project.

It seems to me that this project fits your criteria. It is my understanding that this proposal was put together and submitted to the Office of Management and Budget late in the year, after the passback; is that correct?

Secretary HODEL. That is correct.

Senator BURDICK. This, then, bears little resemblance to the budget you originally submitted to OMB; is that correct?.

Secretary HODEL. That is correct.

Senator BURDICK. Do you have a copy of your original proposal to OMB?

Secretary HODEL. I do not, but we would be happy to supply it for the record.

[The information follows:]

GARRISON DIVERSION UNIT

A copy of the fiscal year 1988 budget proposal of $20 million as submitted to OMB follows:

REGION
Missouri Basin

# PROJECT DATA SHEET

PF-65 (2-84)
Bureau of Reclamation

PROJECT AND STATE PICK-SLOAN MISSOURI BASIN PROGRAM
GARRISON DIVERSION UNIT, NORTH DAKOTA

| Completion Date | % Complete | Date |
|---|---|---|
| 1/ | 19 | 9/30/86 |

AUTHORIZATION
P.L. 89-108, August 5, 1965, P.L. 98-360, July 16, 1984, and P.L. 99-294, May 12, 1986

LAND CERTIFICATION 2/

DEFINITE PLAN REPORT 3/

| BENEFIT COST RATIOS | | |
|---|---|---|
| Based on Direct Benefits | Based on Total Benefits | Date |
| 1.1 4/ | 1.6 4/ | 10/1/87 |

## SUMMARIZED FINANCIAL DATA

| | | | | |
|---|---|---|---|---|
| Total Federal Obligations (Reclamation) 17/ | $1,177,481,000 | Allotments to September 30, 1986 | | $ 275,241,000 |
| Net Property and Other Transfers | | Allotments for FY 1987 | | 18,000,000 |
| Federal Participation | 5,492,000 | | | |
| Non Federal Participation 5/ | 74,525,000 | Allotments to Date | | 293,241,000 |
| Adjustment 6/ | 42,400,000 | Allotments Required for FY 1988 | | 20,000,000 |
| Total to be Allocated | $1,299,898,000 | Balance to Complete after FY 1988 | | $ 864,240,000 |

| ALLOCATIONS 7/ | | REPAYMENT | | |
|---|---|---|---|---|
| Irrigation | $ 743,204,000 | Amount Repaid by Irrigators | 9/ | $ 8,729,000 |
| Power | 38,000 | Amount Repaid by Power | 10/ | 718,517,000 |
| M & I Water | 336,850,000 | Amount Repaid by M & I Water | 9/ | 9,958,000 |
| Recreation | 31,212,000 | | | |
| F & WL | 45,769,000 | | | |
| Flood Control | 8,552,000 | | | |
| Highway Imprvmt. | 4,650,000 | Non-Federal Contributions | 11/ | 74,529,000 |
| | | Indian Deferred | 12/ | 89,060,000 |
| Other 8/ | 129,623,000 | Nonreimbursable | 13/ | 399,105,000 |
| Total | $1,299,898,000 | Total | | $1,299,898,000 |

| AMOUNTS PER ACRE | | | |
|---|---|---|---|
| Irrig. Invest. per Acre | 5,676 | Payment Capacity per Acre | 26.32 |
| Repayment of Investment per Acre: | | Annual Charges: | |
| By Irrigators 14/ | 67 | O & M | 25.12 |
| By Power Revenues | 4,927 | Construction | 1.20 |
| By M & I Water Users | --- | | |
| By Contributions | 2 | | |
| Indian Irrigation (Deferred) | 680 | | |
| | | Total 15/ | 26.32 |

STATUS OF REPAYMENT CONTRACT: Execution of the master contract with Garrison Diversion Conservancy District and three-way contracts between Bureau of Reclamation, Conservancy District, and Irrigation Districts, containing approximately 113,000 acres of irrigable land, was completed March 16, 1966. Court validation was completed July 26, 1966, and confirmed August 10, 1966. Any required renegotiation to conform to the reformulation legislation will occur prior to construction activity. Repayment contract for M&I water estimated to be executed in February 1987.

STATUS OF NEPA COMPLIANCE: 16/ A draft environmental statement (DES-86-4) addressing the Garrison Commission recommendations was filed with the Environmental Protection Agency on March 6, 1986. A draft addendum to DES-86-4, addressing the reformulated plan, will be processed. The Final Supplement to the Environmental Statement (FSES) will be a combination of (DES-86-4) and the addendum addressing the reformulated plan. The FSES is scheduled for filing in May 1987.

DESCRIPTION: The project, as reformulated by Public Law 99-294, is substantially in accordance with the recommendations o the Garrison Diversion Unit Commission Final Report (dated December 20, 1984). The plan authorized by Public Law 99-294 consists of 130,940 acres of irrigated lands. This includes 85,360 acres of lands in the following irrigation areas: McClusky Canalside Irrigation (4,000), Oakes Test Area (5,000), West Side Irrigation Area (14,660), West Oakes Extension Area (4,000), LaMoure Irrigation Area (13,350), New Rockford Canal Area (1,200), New Rockford Irrigation Area (20,935), Lincoln Valley Irrigation Area (6,515), Turtle Lake Irrigation Area (13,700), and Harvey Irrigation Area (2,000).

## PROJECT DATA SHEET - 2

Pick-Sloan Missouri Basin Program
Garrison Diversion Unit, North Dakota

DESCRIPTION: (continued) Irrigation is also included for 17,580 acres on Fort Berthold and Standing Rock Indian Reservations; and 28,000 acres in unspecified areas but not located in the Hudson Bay, Devils Lake, or James River drainages. Irrigation facilities to service those lands in the specified areas in central and eastern North Dakota include McLean, Burleigh, Sheridan Wells, Foster, Stutsman, LaMoure, and Dickey Counties. The reformulation plan is multipurpose and would provide 50,000 acre feet of municipal, rural, and industrial water service to as many as 130 towns and service areas throughout North Dakota. Missouri River water would be made available to the extent possible to provide service to irrigation areas and for the municipal, rural, and industrial deliveries. Water delivered into the Hudson Bay drainage would be treated to avoid biota transfer to Canada. The plan also includes measures for mitigation and enhancement of wetlands and provides for recreation development.

OTHER INFORMATION: Funds to initiate preconstruction work were appropriated in fiscal year 1966 and for construction in fiscal year 1967. Construction is proceeding on features specified for completion in the Reformulation Act. This includes portions of the main supply system and the Oakes Test Area irrigation facilities. The municipal, rural, and industrial water may proceed as soon as a cooperative agreement is signed with the State.

THE COMMISSION PLAN AS MODIFIED: The Garrison Diversion Unit Commission was appointed by the Secretary in accordance with Title II, Section 207 of Public Law 98-360. The Commission was established to examine the contemporary water needs of North Dakota and propose development alternatives which would lead to early resolution of problems identified with the previously authorized 250,000-acre plan. The Commission submitted conclusions and recommendations to the Secretary in its final report dated December 20, 1984. The Garrison Diversion Unit Reformulation Act of 1986 amended selected portions of the 1965 Garrison Reauthorization Act and authorized construction of the project substantially in accordance with the Commission recommendations. The Reformulation Act also provides for the following: Specific deauthorization of 922,910 acres of previously authorized irrigation; utilizing the State MR&I proposal which includes up to $200 million Federal grant funds; sizing certain main supply works to only that capacity necessary to service the authorized project; retaining the status of Sheyenne Lake National Wildlife Refuge until Lonetree Dam and Reservoir is built; eliminating funding constraints on mitigation; eliminating mitigation credit for reservoir sites; requiring purchase of up to 5,000 acres in the Draft and Pickell Slough areas; requiring special studies on the James River drainage basin with a report to Congress by September 1988; prohibiting construction in irrigation areas until after September 1990; substituting 28,000 acres of undefined irrigation acres and transferring 4,000 irrigation acres to the West Oakes Extension Area to replace 32,000 acres previously specified in the New Rockford Extension Area; requiring a 10 percent surplus crop production charge for growing basic agricultural commodities on project lands; limiting the authorized ceiling and omitting indexing of costs; and establishing a wildlife trust fund involving both Federal and State funding. Details of the Reformulation Act of 1986 are contained in House Report 99-525 dated April 9, 1986.

PROJECT DATA SHEET - 3
Pick-Sloan Missouri Basin Program
Garrison Diversion Unit, North Dakota

CANADIAN CONCERNS: The Canadian Government has generally been supportive of the reformulated project. This has been indicated by Diplomatic Note No. 201 dated March 26, 1985, and in letters commenting on the 1986 draft EIS (letters dated April 29, 1986, from Saskatchewan Premier Grant Devine, and April 24, 1986, from Manitoba Minister of Natural Resources Leonard E. Harapiak). Continuing concerns which will require future consultations include the location of Sykeston Canal; irrigation in several of the irrigation areas including Lincoln Valley, Harvey Pumping, New Rockford, and Fort Totten; the Robinson Coulee diversion proposed; the operation of the Sheyenne River Water Treatment Facility; the Devils Lake Basin; and the Coal Mine Lake fishery. Interaction between the two countries will be necessary as final designs are approached.

Footnotes:

1/ Completion date for the unit is not firm because authorizing legislation does not provide sufficient funds to complete the project. Development of irrigation areas cannot start until FY 1991.

2/ Lands included in the 250,000-acre plan were certified for gravity irrigation in March 1966. Recertification is required because of the change from gravity to sprinkler irrigation. The 5,000 acres for the Oakes test area were recertified in April 1981. Other lands are scheduled for recertification prior to initiating construction in specific irrigation areas, including the lands proposed under the 130,940-acre reformulated plan. The Secretary is (1) authorized to develop irrigation on 85,360 specifically identified acres, (2) authorized and directed to develop up to 28,000 acres of irrigation in North Dakota not located in the Hudson Bay, Devils Lake, or James River Drainage Basins, and (3) authorized to develop irrigation on 17,580 acres in the Fort Berthold and Standing Rock Indian Reservations.

3/ Definite Plan Report for the 250,000-acre plan was approved February 21, 1966. The Garrison Diversion Unit Commission proposed an alternate plan in their report dated December 20, 1984. Definite Plan Report Supplement not required as project plan has been defined by Public Law 99-294.

4/ Benefit-cost ratios for the Commission Plan as presented in the FY 1987 Budget Justifications were 1.0 direct and 1.4 total. Benefit-cost ratios for the reformulated plan are 1.1 direct and 1.6 total as calculated for October 1987 levels. These differences are due to updated cost estimates and variances between the Commission Plan and the reformulated plan.

5/ Includes municipal, rural, and industrial water supply ($66,667,000), non-federal recreation lands ($6,850,000), wetlands trust ($800,000), and funds advanced by the Garrison Diversion Conservancy District ($207,966).

PROJECT DATA SHEET - 4
Pick-Sloan Missouri Basin Program
Garrison Diversion Unit, North Dakota

Footnotes: (continued)

6/ Includes interest-free pumping power investment of $27,634,000; assigned main-stem storage cost of $11,794,000; mainstem storage of $2,252,000; reimbursable interest during construction for municipal, rural and industrial water supply of $719,000; $1,000 associated with assigned costs for potential power at Jamestown Dam; and $34 rounding.

7/ Changes in allocations from the Commission plan, shown in the FY 1987 Budget Justifications, and the current authorized reformulated plan, are shown below:

| Allocation | FY 1987 Estimate Commission Plan | FY 1988 Estimate Authorized Plan |
|---|---|---|
| Irrigation | $ 843,665,000 | $ 743,204,000 |
| Power | 38,000 | 38,000 |
| M&I Water | 546,369,000 | 337,650,000 |
| Recreation | 26,812,000 | 31,212,000 |
| Fish and Wildlife | 69,599,000 | 45,769,000 |
| Flood Control | 2,813,000 | 8,552,000 |
| Highway Improvements | 4,650,000 | 4,650,000 |
| Other | 1,000,000 | 128,823,000 |
| Total | $1,494,496,000 | $1,299,898,000 |

Explanation of changes in allocation from FY 1987 Budget Justifications (Commission plan), to current authorized reformulated plan.

| Explanation | |
|---|---|
| Charges on plan formulation | $ -130,053,000 |
| Interest During Construction | -32,702,000 |
| Total | $ -162,755,000 |

8/ Represents $1,000,000 for cultural resources activities, P.L. 93-291, $3,500,000 for Kraft Slough, $12,800,000 for wetlands trust, $6,300,000 James River Comprehensive Study, $53,203,000 unused facilities, and $52,820,000 for unused capacity.

PROJECT DATA SHEET - 5
Pick-Sloan Missouri Basin Program
Garrison Diversion Unit, North Dakota

Footnotes: (Continued)

9/ The scheduled amounts to be repaid by irrigators and municipal and industrial water interests will be covered by contracts before construction on these areas begins. These amounts exclude the surplus crop production charge for delivery of project water to crops determined to be in excess of normal supply.

10/ The amount to be repaid by power is currently identified for repayment from net power revenues generated by the Pick-Sloan Missouri Basin Program power rate.

11/ Non-Federal contributions include $66,667,000 for municipal, rural, and industrial water systems; $6,850,000 for non-federal recreation contributions; $800,000 wetland trust; $207,966 advanced by the Garrison Diversion Conservancy District for construction of the District headquarters building; land donated by the District for the headquarters building valued at $3,500; and $320 donation from Sheridan County for highway construction. This will be allocated $60,667,000 to municipal, rural, and industrial water systems, $6,850,000 to recreation, $800,000 to other, and $211,786 to irrigation.

12/ The Reformulation Act directs that repayment for irrigation units developed within the boundaries of the Fort Berthold and Standing Rock Indian Reservations shall be made pursuant to the Leavitt Act (25 U.S.C. 386.2).

13/ Estimated nonreimbursable costs include $45,620,000 fish and wildlife, $24,212,000 recreation, $8,503,000 flood control, $4,650,000 for construction of highways to current standards under Public Law 93-251, $1,000,000 for cultural resources activities under Public Law 93-291, $3,500,000 for Kraft Slough, $12,000,000 for wetlands trust, $6,300,000 for James River Comprehensive Study, $200,000,000 for MR&I, $40,500,000 for Sheyenne River release facility, and $52,820,000 for unused capacity. Unused capacity costs of $53,202,697 are to be reimbursed under current Reclamation repayment policy.

14/ Of the amount shown, $17 will be repaid by Garrison Conservancy District revenues under existing contracts and the balance will be repaid by irrigators.

15/ The increase of $0.62 per acre from the FY 1987 Budget Justifications is due to indexing estimated operation, maintenance, and replacement (OM&R) costs.

16/ Project-wide final environmental statement on the 250,000-acre plan was filed with Council on Environmental Quality January 10, 1974. Supplemental - Fish and Wildlife filed with Council on Environmental Quality on May 3, 1974. Final comprehensive supplemental to Final Environmental Statement filed with Environmental Protection Agency on March 7, 1979. The Final Supplemental Environmental Statement on features for initial development of 85,000 acres on the 250,000-acre plan was filed with the Environmental Protection Agency on July 15, 1983.

PROJECT DATA SHEET - 6
Pick-Sloan Missouri Basin Program
Garrison Diversion Unit, North Dakota

Footnotes: (continued)

17/ Appropriations authorized are $679,840,000 in addition to amounts previously authorized ($275,240,000). The comparable Federal obligation is $1,177,481,000 which exceeds the appropriation ceiling by more than the amount of contingencies included in the obligation. House Report 99-525, which supports P.L. 99-294, states:

> The Committee notes that these funds would provide sufficient authorization for the construction of all the supply works and only $100 million of the total $322 million required to complete construction of the irrigation service facilities. This will mean that an increase in authorizations will be required in order to complete the irrigation service areas, as authorized by H.R. 1116. The Committee believes this is the best way to ensure oversight of the construction progress on the project. In addition, the Committee would note that the authorization of appropriation figures are not indexed to increase with inflation. The authorization of appropriations are not indexed in order to force additional enactment of authorizations at some future date. This will ensure the proper oversight and involvement of the authorizing committees.

### PICK-SLOAN MISSOURI BASIN PROGRAM
### GARRISON DIVERSION UNIT, NORTH DAKOTA
### PHYSICAL DATA ON STRUCTURES - 7

COMPLETED WORK:

Jamestown Reservoir and Dam

Dam:
Type - earthfill
Hydraulic Height - 64 feet
Crest Length - 1,420 feet
Base Width - 780 feet

Spillway:
Type - Morning glory
Design Discharge - 2,930 cubic feet per second

Reservoir Capacity:
Total Capacity - 380,000 acre-feet

CONSTRUCTION PROGRAM:

Principal Supply Works

Snake Creek Pumping Plant
Three Units - 8,000 hp each

Capacity: 683.3 cubic feet per second per unit

McClusky Canal
Length - 73.6 miles
Bottom Width - 25 feet
Water Depth - 17.3 feet

Capacity: 1,950 cubic feet per second

Sykeston Canal 1/
Length - 26.0 miles
Bottom width - 38 feet
Water depth - 9.2 feet

Capacity: 1,000 cubic feet per second

McClusky Canalside Irrigation
Distribution System - 6 miles pipe
Drains - 50 miles pipe
Irrigation - 4,000 acres

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1/ Change in size due to adoption of Reformulated Plan.

### PICK-SLOAN MISSOURI BASIN PROGRAM
### GARRISON DIVERSION UNIT, NORTH DAKOTA
### PHYSICAL DATA ON STRUCTURES - 8

Principal Supply Works (Continued)

Lonetree Reservoir: 2/
Type - earthfill
Structural Height - 90 feet
Crest Length - 3,200 feet
Base Width - 540 feet

Spillway:
None

Reservoir Capacity:
Total Capacity: 534,700 acre-feet

Souris Section 3/

Oakes Section

Oakes (West Side) Test Area
Service area 5,000 acres (designed to serve 7,800 acres).

Oakes Pumping Plant
Eight units - horsepower has not been determined

Capacity: Three units at 18.7 cubic feet per second each
Five units at 57 cubic feet per second

West Side Irrigation Facilities 4/
Distribution System - 51 miles
Drains - 121 miles
Irrigation - 14,660 acres

West Oakes Extension Area
Distribution System - 5.1 miles
Drains - 121 miles
Irrigation - 4,000 acres

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2/ Garrison Diversion Reformulation Act mandates that completion of construction be deferred pending a determination of need by the Secretary of the Interior, satisfactory conclusion of consultations with Canada, and reauthorization by Congress.

3/ Deleted due to adoption of Reformulated Plan.

4/ West Oakes 5,000-acre test area is not included in the total for West Side irrigation facilities.

PICK-SLOAN MISSOURI BASIN PROGRAM
GARRISON DIVERSION UNIT, NORTH DAKOTA
PHYSICAL DATA ON STRUCTURES - 9

| | |
|---|---|
| Oakes Section (Continued) | |
| Oakes Canal<br>Length - 2.5 miles 5/ | Capacity: 200 cubic feet per second |
| Offstream Storage or Groundwater Recharge | Capacity: 36,500 acre-feet |
| LaMoure Section | |
| LaMoure Irrigation Facilities<br>Distribution System - 39 miles<br>Drains - 67 miles<br>Irrigation - 13,350 acres | |
| Central North Dakota Section | |
| New Rockford Canal 5/<br>Length - 58.5 miles<br>Bottom Width - Reaches 1 and 2 - 44 feet<br>Water Depth - Reaches 1 and 2 - 10.4 feet | Capacity: 1,600 to 800 cubic feet per second |
| New Rockford Canal Area Irrigation 5/<br>Distribution System - 2 miles pipe<br>Drains - 15 miles pipe<br>Irrigation - 1,200 acres | |
| James River Feeder Canal 5/<br>Length 2.6 miles<br>Bottom Width - 22.0 feet<br>Water Depth - 5.7 feet | Capacity: 450 cubic feet per second |
| Upper James River Improvement 5/<br>Length - 3.3 miles | Capacity: 450 cubic feet per second |
| Lower James River Improvement 5/<br>Length - 5.1 miles | Capacity: 450 cubic feet per second |

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5/ Changes in size due to adoption of Reformulated Plan

PICK-SLOAN MISSOURI BASIN PROGRAM
GARRISON DIVERSION UNIT, NORTH DAKOTA
PHYSICAL DATA ON STRUCTURES - 10

Central North Dakota Section (Continued)

New Rockford Irrigation Area
Distribution System - 44 miles
Drains - 179 miles
Irrigation - 20,935 acres

New Rockford Irrigation Extension Area 6/

Lincoln Valley Irrigation Area
Distribution System - 15 miles
Drains - 108 miles
Irrigation - 6,515 acres

Turtle Lake Irrigation Facilities
Distribution System - 5 miles open - 25 miles pipe
Drains - 12 miles open - 96 miles pipe
Irrigation - 13,700 acres

Harvey Pumping Irrigation Facilities
Distribution System - 3 miles pipe
Drains - 25 miles pipe
Irrigation - 2,000 acres

Irrigation Other Areas in North Dakota 7/
Irrigation - 28,000 acres

Indian Missouri River Pumping Irrigation Area

Lucky Mound
Distribution System - 19 miles pipe
Drains - 50 miles pipe
Irrigation - 7,700 acres

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6/ Deleted due to adoption of Reformulated Plan.
7/ Areas have not yet been defined.

## PICK-SLOAN MISSOURI BASIN PROGRAM
## GARRISON DIVERSION UNIT, NORTH DAKOTA
## PHYSICAL DATA ON STRUCTURES - 11

Indian Missouri River Pumping Irrigation Area (Continued)

Upper Six Mile Creek
Distribution System - 19 miles pipe
Drains - 49 miles pipe
Irrigation - 7,500 acres

Fort Yates
Distribution System - 6 miles pipe
Drains - 16 miles pipe
Irrigation - 2,380 acres

Domestic and Rural Water 8/
Municipal, industrial, and rural water systems

Capacity: 50,000 acre-feet

Land and Rights
Quantity - 330,800 Acres
Total Estimated Cost - $143,199,413
Cost per Acre - $433
Acquisition - 13 percent complete as of September 30, 1986

Relocations
Total Estimated Cost $15,390,000
Percent Complete - 35 percent complete as of September 30, 1986

| Items | Length (miles) | Total Cost | Estimated Cost to September 30, 1986 |
|---|---|---|---|
| County and State Highways . . . . . . . | 77 | $12,310,000 | $5,040,000 |
| Utilities . . . . . . . . . . . . . . . | 139 | 3,080,000 | 380,000 |
| Total | | $15,390,000 | $5,420,000 |

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8/ Change due to adoption of Reformulated Plan.

Appropriation Title: Construction Program
Construction and Rehabilitation

PICK-SLOAN MISSOURI BASIN PROGRAM
GARRISON DIVERSION UNIT, NORTH DAKOTA

FISCAL YEAR 1988

| Work Proposed | Program |
|---|---|
| **Principal Supply Works** | |
| Snake Creek Pumping Plant - Operation, maintenance, site security, and freshening of Audubon Lake will continue. | $ 200,000 |
| McClusky Canal - Routine operations and maintenance will continue. | 890,000 |
| Sykeston Canal - Provides for preconstruction activities. | 500,000 |
| McClusky Canal Area Irrigation - Provides for preconstruction activities. | 10,000 |
| Lonetree Reservoir - Noxious weed control and management activities will continue. | 50,000 |
| **Oakes Section** | |
| Oakes Test Area - Operation and maintenance activities will continue. | 150,000 |
| West Side Irrigation Facilities - Provides for preconstruction activities. | 50,000 |
| West Oakes Extension Area - Provides for preconstruction activities. | 70,000 |
| Offstream Storage or Ground-Water Recharge - Provides for preconstruction activities. | 400,000 |
| Oakes Canal - Provides for preconstruction activities. | 30,000 |

Appropriation Title: Construction Program
Construction and Rehabilitation

PICK-SLOAN MISSOURI BASIN PROGRAM
GARRISON DIVERSION UNIT, NORTH DAKOTA

FISCAL YEAR 1988

| Work Proposed (continued) | Program |
|---|---|
| LaMoure Section | |
| LaMoure Irrigation Facilities - Provides for preconstruction activities. | $ 50,000 |
| Central North Dakota Section | |
| New Rockford Canal - Burlington Northern Railroad relocation; continuance of Reach 1B-Lining and Drains, Reach 2, and preconstruction activities will continue. | 7,500,000 |
| New Rockford Canal Area Irrigation - ) | 10,000 |
| James River Feeder Canal - ) Provides for preconstruction activities. | 70,000 |
| Upper James River Improvement - ) | 50,000 |
| Lower James River Improvement - Provides for preconstruction activities. | 800,000 |
| New Rockford Irrigation Facilities - ) | 200,000 |
| Lincoln Valley Irrigation Facilities - ) Provides for preconstruction activities. | 50,000 |
| Turtle Lake Irrigation Facilities - ) | 100,000 |

Appropriation Title: Construction Program
Construction and Rehabilitation

PICK-SLOAN MISSOURI BASIN PROGRAM
GARRISON DIVERSION UNIT, NORTH DAKOTA

FISCAL YEAR 1988

| | | Program |
|---|---|---|
| Work Proposed (continued) | | |
| Central North Dakota Section (continued) | | |
| Harvey Pumping Irrigation Facilities - | Provides for preconstruction activities. | $ 50,000 |
| Irrigation Other Areas in North Dakota - | | 100,000 |
| Indian Missour River Pumping Irrigation Areas | | |
| Lucky Mound - | Provides for preconstruction activities. | 50,000 |
| Upper Six Mile Creek - | | 50,000 |
| Fort Yates - | | 50,000 |
| Domestic and Rural Water | | |
| M&I and Rural Water Systems - Provides for continuation of funding for contracts on the Cheyenne River Release Treatment Facility and other M&I facilities, including transfer of funds to the state of North Dakota. | | 930,000 |
| General Facilities | | |
| Permanent Operating Facilities - The Oakes office addition and the Oakes Test Area controls, and the acquisition of office and O&M equipment will be completed. | | 1,690,000 |
| Fish and Wildlife Facilities - Provides for land acquisition, payments to the Wetlands Trust Fund, Kraft Slough and associated developments. | | 1,980,000 |

Appropriation Title: Construction Program
Construction and Rehabilitation

PICK-SLOAN MISSOURI BASIN PROGRAM
GARRISON DIVERSION UNIT, NORTH DAKOTA

FISCAL YEAR 1988

| | Program |
|---|---|
| Work Proposed (continued) | |
| General Facilities (continued) | |
| Recreation Facilities - Provides for recreation facilities at Devils Lake Brekken-Holmes. | $ 380,000 |
| Other Project Costs - Provides for transitional development and comprehensive studies recommended by the Garrison Reformulation Act. | 3,670,000 |
| | $20,130,000 |
| Non-Federal Participation - State of North Dakota share of M&I cost. | -130,000 |
| TOTAL | $20,000,000 |

GARRISON DIVERSION UNIT, P-S
SCHEDULE OF CONSTRUCTION PROGRAM FISCAL YEAR 1987 AND FISCAL YEAR 1988

| PROGRAM ITEM | NOTE | ESTIMATED TOTAL | TOTAL TO SEPTEMBER 30 1986 | FY 1987 PROGRAM | FY 1988 PROGRAM | BALANCE TO COMPLETE |
|---|---|---|---|---|---|---|
| 1 * CONSTRUCTION COSTS | | | | | | |
| 2 -COMPLETED WORK- | | | | | | |
| 3 ** COMPLETED FEATURES | | | | | | |
| 4 | | 3,727,379 | 3,727,379 | | | |
| 5 -TOTAL FOR COMPLETED WORK- | | 3,727,379 | 3,727,379 | | | |
| 6 * CONSTRUCTION COSTS | | | | | | |
| 7 ** PRINCIPAL SUPPLY WORKS | | | | | | |
| 8 *** SNAKE CREEK PUMPING PLANT | | | | | | |
| 9 | | 21,000,000 | 19,985,263 | 200,000 | 200,000 | 614,737 |
| 10 *** MCCLUSKY CANAL | | | | | | |
| 11 | | 116,850,000 | 96,504,165 | 1,710,000 | 890,000 | 17,745,835 |
| 12 *** SYKESTON CANAL | | | | | | |
| 13 | | 31,200,000 | 386,894 | 350,000 | 500,000 | 29,963,106 |
| 14 *** MCCLUSKY CANAL AREA IRRIGATION | | | | | | |
| 15 | | 10,340,000 | 10,000 | 10,000 | 10,000 | 10,310,000 |
| 16 *** LONETREE RESERVOIR | | | | | | |
| 17 | | 40,000,000 | 35,878,559 | 100,000 | 50,000 | 3,971,441 |
| 18 *** DELETED FEATURES | | | | | | |
| 19 | | 18,360,320 | 18,360,320 | | | |
| 20 ** PRINCIPAL SUPPLY WORKS | | 237,750,320 | 171,125,201 | 2,370,000 | 1,650,000 | 62,605,119 |
| 21 ** OAKES SECTION | | | | | | |
| 22 *** OAKES TEST AREA | | | | | | |
| 23 | | 32,300,000 | 27,858,610 | 2,210,000 | 150,000 | 2,081,390 |
| 24 *** WEST SIDE IRRIGATION FACIL | | | | | | |
| 25 | | 33,350,000 | 7,436,628 | 50,000 | 50,000 | 25,813,372 |
| 26 *** WEST OAKES EXTENSION AREA | | | | | | |
| 27 | | 13,560,000 | 100,000 | 10,000 | 70,000 | 13,380,000 |
| 28 *** OFFSTRM STOR OR GRDWTR RECHRG | | | | | | |
| 29 | | 43,300,000 | 1,087,147 | 300,000 | 400,000 | 41,512,853 |
| 30 *** OAKES CANAL | | | | | | |
| 31 | | 2,800,000 | 60,000 | 10,000 | 30,000 | 2,700,000 |

GARRISON DIVERSION UNIT, P-S
SCHEDULE OF CONSTRUCTION PROGRAM FISCAL YEAR 1987 AND FISCAL YEAR 1988

| PROGRAM ITEM | NOTE | ESTIMATED TOTAL | TOTAL TO SEPTEMBER 30 1986 | FY 1987 PROGRAM | FY 1988 PROGRAM | BALANCE TO COMPLETE |
|---|---|---|---|---|---|---|
| 1 ** OAKES SECTION | | 126,310,000 | 36,542,388 | 2,580,000 | 700,000 | 86,487,618 |
| 2 ** LAMOURE SECTION<br>3 | | 35,800,000 | 2,915,626 | 50,000 | 50,000 | 32,784,374 |
| 4 ** CENTRAL N DAK SECTION | | | | | | |
| 5 *** NEW ROCKFORD CANAL<br>6 | | 59,340,000 | 29,526,177 | 4,220,000 | 7,500,000 | 18,093,823 |
| 7 *** NEW ROCKFORD CANAL AREA IRRIG<br>8 | | 3,100,000 | 10,000 | 10,000 | 10,000 | 3,070,000 |
| 9 *** JAMES RIVER FEEDER CANAL<br>10 | | 2,800,000 | 290,870 | 40,000 | 70,000 | 2,399,130 |
| 11 *** UPPER JAMES RIVER IMPROVEMENT<br>12 | | 6,400,000 | 421,264 | 10,000 | 50,000 | 5,918,736 |
| 13 *** LOWER JAMES RIVER IMPROVEMENT<br>14 | | 11,540,000 | 1,984,515 | 250,000 | 800,000 | 8,505,485 |
| 15 *** NEW ROCKFORD IRRIGATION FACIL<br>16 | | 67,000,000 | 2,653,891 | 200,000 | 200,000 | 53,946,109 |
| 17 *** LINCOLN VALLEY IRRIG FACIL<br>18 | | 34,510,000 | 989,958 | 10,000 | 50,000 | 33,460,042 |
| 19 *** TURTLE LAKE IRRIGATION FACIL<br>20 | | 37,200,000 | 200,000 | 100,000 | 100,000 | 36,800,000 |
| 21 *** HARVEY PUMPING IRRIG FACIL<br>22 | | 5,800,000 | 50,000 | 10,000 | 50,000 | 5,690,000 |
| 23 *** IRRIG OTHER AREAS IN N DAK<br>24 | | 131,830,000 | 100,000 | 10,000 | 100,000 | 131,620,000 |
| 25 ** CENTRAL N DAK SECTION | | 349,520,000 | 36,226,675 | 4,860,000 | 8,930,000 | 299,503,325 |
| 26 ** INDIAN MISSOURI R PUMP IRRIG | | | | | | |
| 27 *** LUCKY MOUND<br>28 | | 27,900,000 | 250,000 | 50,000 | 50,000 | 27,550,000 |
| 29 *** UPPER SIX MILE CREEK<br>30 | | 27,440,000 | 200,000 | 50,000 | 50,000 | 27,140,000 |
| 31 *** FORT YATES<br>32 | | 12,570,000 | 200,000 | 50,000 | 50,000 | 12,270,000 |

GARRISON DIVERSION UNIT, P-S
SCHEDULE OF CONSTRUCTION PROGRAM FISCAL YEAR 1987 AND FISCAL YEAR 1988

| PROGRAM ITEM | NOTE | ESTIMATED TOTAL | TOTAL TO SEPTEMBER 30 1986 | FY 1987 PROGRAM | FY 1988 PROGRAM | BALANCE TO COMPLETE |
|---|---|---|---|---|---|---|
| 1 ** INDIAN MISSOURI R PUMP IRRIG | | 67,910,000 | 650,000 | 150,000 | 150,000 | 66,960,000 |
| 2 ** DOMESTIC AND RURAL WATER | | | | | | |
| 3 *** M I AND RURAL WATER SYSTEMS | | | | | | |
| 4 | | 327,670,000 | 21,683,000 | 3,690,000 | 930,000 | 301,367,000 |
| 5 ** DOMESTIC AND RURAL WATER | | 327,670,000 | 21,683,000 | 3,690,000 | 930,000 | 301,367,000 |
| 6 ** GENERAL FACILITIES | | | | | | |
| 7 *** PERMANENT OPERATING FACILITIES | | | | | | |
| 8 | | 21,070,000 | 4,866,287 | 500,000 | 1,690,000 | 14,013,713 |
| 9 *** FISH AND WILDLIFE FACILITIES | | | | | | |
| 10 | | 64,500,000 | 21,401,930 | 1,300,000 | 1,980,000 | 39,818,070 |
| 11 *** RECREATION FACILITIES | | | | | | |
| 12 | | 8,440,000 | 3,493,961 | 480,000 | 380,000 | 4,086,039 |
| 13 ** GENERAL FACILITIES | | 94,010,000 | 29,762,178 | 2,280,000 | 4,050,000 | 57,917,822 |
| 14 ** TEMPORARY CAMPS | | | | | | |
| 15 | | 500,000 | | | | 500,000 |
| 16 ** SERVICE FACIL DEPR SALVAGE | | | | | | |
| 17 | | 1,093,599 | 1,290,271 | | | 196,672- |
| 18 * CONSTRUCTION COSTS | | 1,243,291,298 | 303,922,715 | 15,980,000 | 16,460,000 | 906,928,583 |
| 19 * OTHER PROJECT COSTS | | | | | | |
| 20 ** COMPREHENSIVE STUDIES | | | | | | |
| 21 | | 10,200,000 | 1,984,621 | 2,700,000 | 3,660,000 | 1,855,379 |
| 22 * OTHER PROJECT COSTS | | 14,206,668 | 2,913,887 | 2,720,000 | 3,670,000 | 4,902,781 |
| 23 TOTAL PROGRAM COST | | 1,257,497,966 | 306,836,602 | 18,700,000 | 20,130,000 | 911,831,364 |
| 24 OTHER CONSOL. EXPEND & CREDIT | | 13,139,000- | 10,004,636- | | | 3,134,364- |
| 25 TOTAL EXPENDITURES | | 1,244,358,966 | 296,831,966 | 18,700,000 | 20,130,000 | 908,697,000 |
| 26 NONFEDERAL CASH CONTRIBUTIONS | | 207,966- | 207,966- | | | |
| 27 NONFEDERAL NONCASH CONTRIBUTION | | 66,670,000- | 21,383,000- | 700,000- | 130,000- | 44,457,000- |
| 28 TOTAL FEDERAL EXPENDITURES | | 1,177,481,000 | 275,241,000 | 18,000,000 | 20,000,000 | 864,240,000 |

## GARRISON DIVERSION UNIT, P-S
## SCHEDULE OF CONSTRUCTION PROGRAM FISCAL YEAR 1987 AND FISCAL YEAR 1988

| PROGRAM ITEM | NOTE | ESTIMATED TOTAL | TOTAL TO SEPTEMBER 30 1986 | FY 1987 PROGRAM | FY 1988 PROGRAM | BALANCE TO COMPLETE |
|---|---|---|---|---|---|---|
| 1 TOTAL RECLAMATION EXPENDITURES | | 1,177,481,000 | 275,241,000 | 18,000,000 | 20,000,000 | 864,240,000 |
| 2 TOTAL RECLAMATION OBLIGATIONS | | 1,177,481,000 | 275,241,000 | 18,000,000 | 20,000,000 | 864,240,000 |
| 3 TOTAL FUNDED OBLIGATIONS | | 1,177,481,000 | 275,241,000 | 18,000,000 | 20,000,000 | 864,240,000 |
| 4 METHOD OF FINANCING | | | | | | |
| 5 APPROPRIATION AVAILABLE & REQD | | | | 18,000,000 | 20,000,000 | 864,240,000 |
| 6 NONFEDERAL PARTICIPATION | | | | | | |

Senator BURDICK. In that submission, what was the level of funding you proposed for the Garrison diversion unit?

Secretary HODEL. $20.0 million.

Senator BURDICK. Mr. Secretary, assume for the moment that, by some happenstance, your fiscal year 1988 request was approved by Congress. What impact would such action have on the project office in Bismarck?

Secretary HODEL. That would be the reduction in size discussed by Mr. Duvall, which would reduce it to the 50 level over a 2-year period. I don't know exactly at what rate.

Senator BURDICK. What would happen to the Billings regional office?

Secretary HODEL. I will have to ask Mr. Duvall.

Mr. DUVALL. There may be some effect in the Billings office, but it would be minimal.

Senator BURDICK. It would be a reduction in staff, not an increase in force?

Secretary HODEL. That is true.

Mr. DUVALL. It would not tend to increase the force in Billings, Mont.

Senator BURDICK. Under your present plan, when do you estimate the Department and the Bureau of Reclamation will return to the Garrison project to pick up the pieces?

Secretary HODEL. We plan to return to the project with a more optimum funding level by 1990. Certainly by 1991, we would expect to be at a full optimum construction funding level on the Garrison unit.

Senator BURDICK. I think it is fine to seek the most economical utilization of our funds, but I am not so sure that this isn't a case of tripping over a dollar to pick up a dime. To close out this project and then return to it in 5 years doesn't seem like a very economical approach to me. But you think it is.

Mr. DUVALL. It wouldn't make a lot of sense to terminate employees if you were going to replace those employees. That is the reason we have opted to move toward a construction management contract, so we don't get tied to long-term employment levels.

Senator BURDICK. The alternative is not to terminate them.

Mr. DUVALL. Excuse me?

Senator BURDICK. The alternative is not to terminate the employees.

Mr. DUVALL. If we had the $6 to $8 million a year that we could afford to spend on that project, plus the other 60-some projects that we have under construction now, then that is true.

Senator BURDICK. Before this Congress is over you might have it.

Mr. DUVALL. That may be.

Senator JOHNSTON. We will take it out of the deficit. That is big enough to accommodate it. [Laughter.]

### RISK INVOLVED WITH NEW PROPOSAL

Senator BURDICK. As I have already indicated, Mr. Secretary, I strongly believe that your proposal needs much more consideration and various potential modifications.

It seems to me that shutting down individual projects for several years is a perfect way to set them up for abandonment, regardless of whether or not that was the original intention. Isn't that likely?

Secretary HODEL. Senator, I don't believe that it is likely, but I would have to acknowledge that the risk is there. My belief is that we run a similar risk, not necessarily with Garrison or any specific project, but with some number of these projects because we would be going along with the kind of funding approach of the past. We keep offices open but don't complete projects. Eventually, somebody looks at it and says, "Wait a minute. You have been building this project," like the Central Utah Project, "for 18 years."

I asked, "When would that project have been completed under optimal funding?" It would have been several years ago. I then asked, "When would it be completed if we started optimal funding now?" I am told 1995. I said, "When will it be completed if we continue the kind of practice we have been doing?" The answer is, basically, nobody knows. It just doesn't get finished.

What I fear and what I see happening, Senator, and this should be alarming to all of us that support water projects and irrigation, is that we are now beginning to finish some projects in the West where the irrigators are telling us it has taken so long and it has cost so much more than the original estimate that they can't afford the water.

If they are right, had the project been properly designed and built, and had we funded it properly to build it, the water would have been affordable. We can't defend or maintain a program, I fear, over the long haul if many irrigators say, "It's not doing us any good."

That has raised my level of concern and I share your concern. But I believe the best way to defend these projects is to show that we are capable of building them on a realistic schedule. If we proceed in this fashion, I would hope that we can do that with optimal funding. If we were to fund the Garrison project at the $30 million a year level, on paper it would take us 30 years. Nobody believes that there won't be changes during that time that could raise it to 40 years to complete the project.

That is almost as indefensible, Senator, as the time it has taken us to get to the point where we wholeheartedly support the project, which we do. I would like to move it to an optimal construction schedule and get it finished 10 or 12 years from now.

### PROJECT PRIORITY

Senator BURDICK. Mr. Secretary, I have stood in line at a lot of barbecues and dinners and so forth. I waited my turn. And you say the Central Utah Project has been around for 18 years. Well, I want you to know that the Garrison project has been around for 22 years. So, why must we go to the end of the line?

Secretary HODEL. Senator, I don't go back that far with the Bureau. They tell me they have been constructing on the Central Utah Project for that period of time and very sizable construction expenditures have been made.

Construction on Garrison began 20 years ago, but we have only succeeded in completing 19 percent of the project. Last year's effort, following the Commission report, was to try to find a basis on which we could reach agreement and go forward with the project.

We believe we are there. We do not intend to abandon the project.

Senator BURDICK. You will have to concede, Mr. Secretary, that this is a little hurtful to be pushed out of line and be set back.

Secretary HODEL. Yes; I do.

Senator BURDICK. In this particular case, 5 years. That is our problem. Well, it is very painful to North Dakota, because after all, we agreed to the reformulation that took place last year. We had everybody aboard—the Congress was aboard, Canada was aboard, and the administration was aboard. Now all of a sudden, we find that we have—I didn't refer to it—but a paltry $2.5 million. You can understand how the people in North Dakota feel about this proposal.

Secretary HODEL. I do, sir.

Senator BURDICK. In view of the fact that we have been in here fighting for all these years and supporting water resource development in other areas, including the Bureau of Reclamation, we just believe it is unfair to be put in this situation.

There is only one thing we can do: We consider this $2.5 million probably wouldn't be adequate to take care of the costs of running the project office. Maybe it will help some to reduce the personnel, but it is really a pittance. You can understand why we may have to, not may have to, but will have to fight for a better deal for Garrison.

Secretary HODEL. Yes, sir.

Senator BURDICK. Thank you, Mr. Chairman.

### POSSIBLE BUDGET ADJUSTMENTS

Senator JOHNSTON. Senator McClure?

Senator MCCLURE. Thank you very much, Mr. Chairman. Mr. Secretary, you have given us a chart that shows a construction program based upon your current proposals. Two things drive the decision, if I understand it correctly. I am not trying to put words in your mouth. I am trying to get to a conclusion as quickly as I can. One is that there are large expenditures on at least two large projects—Central Arizona and Central Utah—is that correct?

Secretary HODEL. That is proposed; yes.

Senator MCCLURE. And the total dollar amounts are constrained by budgetary limitations?

Secretary HODEL. Yes; they are.

Senator MCCLURE. And it is working against those parameters that you come up with in this chart?

Secretary HODEL. Yes.

Senator McCLURE. What would the chart look like if we put Garrison in? I assume that the Senators from South Dakota and North Dakota, the two states that are most intimately involved, are going to be asking us to add the $32 million, at least add it for these areas. Would it be your expectation that that would then be an increase in 1988 dollars to $733 million, or would it be an offset against the others?

Secretary HODEL. It has been my assumption that if this proposal is rearranged, it would be an offset against other portions of the proposal, that we would have to find whatever amount, whether it is $6 million or $16 million or $30 million.

Senator McCLURE. If we can find it somewhere else in the budget, however, to offset, it doesn't necessarily have to offset directly against these accounts.

Secretary HODEL. I would assume that is correct, although I am sure that if the Office of Management and Budget is listening, they would not like me suggesting that we go after somebody else's budget.

Senator McCLURE. I didn't hear you make that suggestion. [Laughter.]

Secretary HODEL. It is not you I am worried about, Senator. [Laughter.]

Senator McCLURE. I don't suppose they would be pleased to have me make the suggestion, but they have less authority over me.

If I read this correctly and if I understand what underlies this proposal, rearranging the expenditures within these dollar amounts to concentrate on those large projects in order to bring them to an end earlier, you are in a position to free larger amounts of money for other projects at an earlier date.

Secretary HODEL. We view that as the most economical way to start freeing up large amounts of money for the delayed projects to be optimally funded.

## BUDGET OUTYEAR PROJECTIONS

Senator McCLURE. Starting with 1991, I notice a big dropoff between 1990 and 1991 in the projected expenditures for the construction account.

It is actually a $121 million reduction in those 2 years; is that correct?

Secretary HODEL. I believe that is correct.

Senator McCLURE. Between those 2 years.

Mr. DUVALL. That is correct.

Senator McCLURE. What is the reason for that very large increase? It is an increase from $602 million to $771 million, and then dropping back to $650 million?

Mr. DUVALL. The $650 million is actually the result of determining outyear projection requirements. It is the money needed, having finished some of the projects and contracts that are underway now and by curtailing new starts for those years, for optimum funding in 1991. We are optimumly funding everything that is left to be done in 1991 and then by agreement with OMB, we just straight-lined that number into the outyears.

Senator McCLURE. Has OMB approved the 1988, 1989, and 1990 figures?

Mr. DUVALL. Yes.

## RECLAMATION FUND BALANCES

Senator McCLURE. What is the relationship between those figures and the reclamation fund?

Mr. DUVALL. None, really.

Senator McCLURE. Why isn't there?

Mr. DUVALL. They are not tied to the reclamation fund.

Senator McCLURE. Is the reclamation fund irrelevant?

Mr. DUVALL. For us to spend money out of the reclamation fund, we go through the same budget proposal and through this same appropriations exercise as for the general funds.

Senator McCLURE. Any special fund, whether it is the reclamation fund or the land and water conservation fund or outdoor recreation or many others of that nature are simply paper accounts in one sense. What is the paper account in this sense in the reclamation fund?

Mr. DUVALL. You are speaking of the balance in the fund, Senator. The unappropriated balance in the reclamation fund at the end of 1988 is projected to be $1,087,837,000.

Senator McCLURE. What is the annual accrual to that fund?

Mr. ITTEILAG. It is about $800 million, Mr. McClure. It varies above and below that amount depending on the year.

Senator McCLURE. So even with the $771 million, we are not fully appropriating the amount of money that accrues to that fund?

Mr. ITTEILAG. That is correct. If you were, there wouldn't be an unappropriated balance of that significance.

## PLANNING ACTIVITIES

Senator McCLURE. If I understand your proposal correctly, you will continue at your basic planning activities level?

Mr. DUVALL. In 1987, we are following instructions from the House committee to continue working on those projects that were approved in the 1987 budget. That does give us a problem in 1988, because we have not requested enough funds in 1988 to continue our work force at the 1987 level.

So we are going to have to have some conversation with your staff as well.

Senator McCLURE. What is the difference in figures? How much less money have you requested than it would take to continue the 1987 level?

Mr. DUVALL. To continue the planning activities in fiscal year 1988 at the same level of funding as fiscal year 1987 would require an additional $12 million. However, less than $12 million would be needed if the committee either were to agree with our proposal to mothball planning studies which are not nearly complete and start such mothballing on October 1, 1987, or to take another approach such as not to initiate any new planning studies in fiscal year 1988. We will be available for discussions with the committee staff.

## SAFETY OF DAMS PROGRAM

Senator McCLURE. If I could shift gears for a minute, I want to turn to the safety of dams program. Now, you have requested an increased funding in 1988. Does that keep you on track with your priority projects?

Mr. DUVALL. Yes; it does.

Senator McCLURE. Are all of the priority projects fully funded?

Mr. DUVALL. Yes.

Senator McCLURE. How far does it take you with respect to the second level; how much beyond your priority projects?

Mr. DUVALL. On safety of dams priorities?

Senator McCLURE. Yes.

Mr. DUVALL. We have a safety of dams study program that identified those projects that we feel have to be started in this fiscal year, and we have provided for funding of those plus the ones that are going to be carried over into that year and are underway.

Senator McCLURE. So it is 100 percent on all that have been identified as necessary, but no more than just that group?

Mr. DUVALL. That is correct. We have a small amount of $1 million that we use to take care of nominal safety problems in isolated instances.

Senator McCLURE. Where are you in terms of the severity of those hazards and the funding of the projects? Do you have any that are in imminent failure?

Mr. DUVALL. We have a couple that give us some nightmares at times, but both of those are under construction right now. The one that was of the most concern to us last year was Fontenelle Dam in Wyoming. We have accelerated construction work on Fontenelle Dam and attempted to reduce by 1 year the modification period so that we can have it completed before the third year's runoff.

Senator McCLURE. You say some of them give you nightmares. Do any of them just give you bad dreams? [Laughter.]

Mr. DUVALL. That might be a matter of degree from Fontenelle Dam on down.

Senator McCLURE. Yes. I am really trying to get at whether or not there are ones that trouble you that you would really like to get to but you can't because of funding levels.

Mr. DUVALL. I am comfortable with the 1988 priority that we have set up. I am comfortable with the fiscal year 1988 funding level. We could have a flood or an earthquake 3 days from now, and it might change that priority somewhat, but at the moment, I am.

Senator McCLURE. I understand that. But you have got flood and earthquake hazard studies that give you some kind of an index of what the hazard is at these various locations. I am really trying to probe to see whether you think that study is adequate and whether the funding level is adequate to meet that. I know that is a difficult question as we are dollar constrained throughout the budget. That is no joke and it is no secret.

I have been working on the safety of dams for at least 15 years. It predates the time of the Teton Dam failure, which was a little over 10 years ago now, but that wasn't identified as a safety of dams problem until it broke.

We have some others that have been identified as safety problems, and we have been working against that backlog and making progress. I commend you for it, because it has been a priority.

But it has been a long time since a dam broke. We tend to forget the hazards the longer it goes between tragedies. Are we getting complacent again, or are we really meeting the same sense of urgency that we should address to this threat to public health and safety?

Mr. DUVALL. Hopefully, we are not getting complacent. We went through a dam safety task force study of all of the dams in the Department of the Interior last year. We developed a matrix for prioritizing the dams using all of the technology that we have now as a result of the safety evaluation studies that have been ongoing for several years.

We have prioritized the dams and identified those proposed for starts in 1988 as a result of that study. The other bureaus in the Department of the Interior participated in that study and are applying similar approaches to their dam safety problems.

We also explored and expanded upon our studies for alternatives, reservoir modifications, early warning devices and that sort of thing.

So it is not something that I take lightly. I think probably safety of the facilities that we have from both the standpoint of property and certainly from the human life standpoint is something that we have to put our dollar on first.

Senator MCCLURE. Dale, I am reassured by your answer, and I don't mean to overemphasize it, but I think it is hard to overemphasize situations in which an exposure was justifiable and, perhaps, really not very great at the time a structure was built. Population changes, engineering standards change, evaluations change, and suddenly, we have a situation that looks far different than when we started on a project or even constructed a project many years earlier.

A dam with no population downstream then may have several hundred thousand people living in its flood plain now. That changes the situation dramatically, and we must make sure that we adapt our studies to the changed circumstances and have a program to match what those studies tell us.

You are assuring me that, indeed, you are comfortable with the result of all those evaluations. I am not quarreling with you, because my own evaluation of the program would indicate that that is correct. But I don't want to ever get to the point where we assume that last year's wisdom is sufficient for next year or 2 years from now when situations change, populations change areas, weather patterns do change, as well, and certainly engineering assumptions do.

## KESTERSON RESERVOIR CLEANUP

Mr. Secretary, you suggested that on Kesterson, there may be a more expensive alternative other than the wet flex approach. What do you have in mind?

Secretary HODEL. What I have in mind is the report that I received from the Bureau that the staff of the State Water Resources Control Board has recommended a proposal which could cost approximately $45 million depending on the amount of soil and vegetation removed.

Senator MCCLURE. How does that compare to what is the cost of the wet flex plan?

Secretary HODEL. Seventeen million dollars for the wet flex over a 6-year period.

Senator MCCLURE. So you are saying $17 million versus $45 million?

Secretary HODEL. That is our present understanding. Of course, that is the present estimate as to what it would take.

Senator MCCLURE. How much water is involved in the wet flex? What is the volume of water required to meet that program?

Mr. DUVALL. It is ground water that we are pumping from wells that are either in the process of being drilled there now or have just been drilled, and I couldn't tell you precisely how much it is. It is not coming out of the Central Valley project. We could provide the precise figure for the record.

Senator MCCLURE. Would you supply for the record the amount of water required in that program and how much water might be required in the more expensive alternative? I come from a dry area of the country, and we don't always count the costs just in dollars; we sometimes count the cost in water. That sometimes makes quite a difference to us.

Mr. DUVALL. We will supply that information for the record.

[The information follows:]

### GROUND WATER INVOLVED IN KESTERSON CLEANUP ALTERNATIVES

Ground water requirements for the implementation of the flexible response plan (formerly referred to as wet flex) would be approximately 4,800 acre-feet per year in order to maintain water levels in the southern ponds of Kesterson Reservoir. Ground water requirements of the onsite disposal plan would be minimal. Water use would be for dust control during construction and to aid in compaction of the clay base layer below the plastic or synthetic liner.

## CONSTRUCTION PROGRAM

Secretary HODEL. Could I comment on a question you raised earlier, Senator?

Senator MCCLURE. Yes.

Secretary HODEL. With regard to our proposal, I believe that the budget climate in which we find ourselves and which exists across the board in the Appropriations Committee, the proposal for the Bureau of Reclamation, which represents a $98 million increase in the construction account, would normally be something we could bring to the committee with relative comfort. I caused that comfort to be lost by requesting these priorities that we have talked so much about today.

Even on the safety of dams activities, as a matter of fact, our proposal in 1988 is up $25 or $30 million above what we were requesting for spending in 1987. For fiscal year 1987 we are requesting a reprogramming at this time. Part of that reprogramming that Senator Burdick was asking me about, almost $7 million, is for Fontenelle Dam.

The point I want to make is that I do not feel that the Office of Management and Budget has in any way immured us on this budget for this purpose.

We have disrupted the normal process by suggesting that we put emphasis on some projects, finish some projects, and change the funding structure a little, but with no change in the dollar request. There wasn't a cut that forced me to do something that I never would have thought of otherwise.

Senator McClure. Mr. Secretary, I appreciate that comment, because I expect we will take the $98 million and run with it and smile and not give you much credit for it because we will get lost on the other end of it in being concerned about the change of emphasis.

But I, for one, want to assure my friends with Garrison project that I haven't changed my mind in support of that project.

Senator Burdick. Thank you.

### COMMENTS ON NEW POLICY PROPOSAL

Senator McClure. At the same time, I also want to see us use our money as efficiently as we can. I do remember being in the House of Representatives when the Central Utah Project was started, and I am startled to find out the percentage of completion on that project after all these years.

I think the people who are concerned about a project that is even older have equal reason to be concerned about when it will be finished. I think that is really what we are after. I share with the Senator the concerns that he expressed a moment ago, that if you want to put it on the interrupted list, isn't it going to be harder to get it started again? I would like to explore with him and with others any kind of an assurance that can be as ironclad as any congressional action can be, that if we move in that direction, we are not just doing that by an attempt to kill them by indirection or otherwise, or even to allow that to happen.

I don't understand you to mean that that would be the result. I understand you to mean quite the contrary. But I think we have to explore together means by which we can make that assurance in a realistic way, or I doubt very much the proposal, as soundly based as it may be, will get very far up here.

I guess that is not the first time Congress has frustrated good proposals.

Mr. Chairman, I have no further questions at this time. Thank you very much.

Senator Johnston. Senator Domenici?

## WATER RESOURCE DEVELOPMENT PRIORITIES

Senator DOMENICI. Thank you, Mr. Chairman. Mr. Secretary, I understand quite well your explanation of what you are trying to do in terms of prioritizing activities. I am not sure that we can do things that way here in the Congress, nor that we necessarily should.

On the other hand, while I am not nearly as familiar with the ancient history of the Bureau and its projects, I do happen to have been on the Environment and Public Works Committee until this year for my entire 14 years in the Senate. I vividly recall working on the Corps of Engineers programs and what I found when I was a ranking member of that subcommittee.

I found, believe it or not, that the city of Dallas, Tex., is still authorized as a seaport. Somebody, sometime in the past, when the processes were quite simple, got the resolutions through, and Dallas sat there along with, in my recollection, $30 billion worth of authorized projects.

I vividly recall efforts to try, on the legislative end, to fix some of that up, but when it comes to the Bureau, I don't have that much history. I might suggest to you that you probably could do as much with the dollars and expedite these major projects, which I gather is good business. You must also understand, however, that we have a difficult job of getting support for the Bureau of Reclamation.

The Bureau has a history of being rather regional in scope. I hope you will understand that we need a certain amount of support which, in turn, means that there has to be a certain consideration for projects within the sovereign states that Senators represent in order to get support for a $98 million increase, or perhaps slightly more, if that is what is needed for construction projects.

I am not at all critical of your efforts to try to make the Bureau's programs more efficient and complete some ongoing projects. But I am not as sanguine as you that you can turn things around that fast. I hope you will understand if I now proceed to explain to you, from the standpoint of this Senator, precisely what I am talking about.

Obviously, if you are going to proceed your way, you could have a lag time in planning new projects. In fact, you could decide to suspend planning on a number of projects that you are working on now.

## SOUTHWEST REGIONAL PLANNING EFFORTS

As a matter of fact, Mr. Secretary, you must have that in mind, because in the district that serves New Mexico, the Amarillo District, you now have 54 employees in the planning effort, and if your budget proposals are complied with, you will have 6. You will go from spending $4.5 million to only $600,000.

I hope you understand that while that is only planning money for states like mine, it means planning on a dam for the city of Alamogordo, which is growing rapidly and has some very, very serious water problems. Perhaps it means that you won't work on the Ute Lake pipeline in New Mexico, which is being studied for the transfer of water to some very arid parts of the state.

So how are we going to handle this kind of thing? While you are talking about completing projects, which I have just told you is rather admirable, what kind of long-term planning efforts do we intend to have? Do you really intend that we have none of these projects or that they be put on the shelf for 2, 4, 10 years or longer?

### THE PLANNING PROCESS

Secretary HODEL. Senator, one of the things that makes this a particularly difficult subject matter is that I think we approach this from the same point of view, which is the support for water projects and their importance. One of the things that influenced me in this proposal, when I began talking about the planning process, was that I learned that the average time for a Bureau project to be in planning is 17 years. Now, that is absolutely mind boggling. If this were the private sector, it would be done in perhaps 2 or less years. Because we are the government, we have special restrictions, special hoops that we must go through that take longer. So, I don't think we ought to try to match the private sector.

Senator DOMENICI. I understand.

Secretary HODEL. But we ought to be able to do it in 2 to 4 years, and yet it was taking 17 years. We are spending sometimes several millions of dollars planning something that shouldn't take that, but just because of the time, it does.

Senator DOMENICI. My recollection is that if your projects are taking 17 years to plan, that has been changed because of cost sharing which will be a filtering process. I think when I last looked at planning the Corps of Engineers took over 23 years. I think you are doing better, but proceed. [Laughter.]

Secretary HODEL. As I think you've said to me on occasion, everything is relative.

Senator DOMENICI. Yes, indeed.

Secretary HODEL. What I became aware of is that it takes so long to finish a planning study once the planning process has begun. It may be a perfectly good project and should support a project authorization and get into construction. However, due to constraints on construction money it doesn't come through the planning process. It remains in the planning stage because there is a backlog of construction.

My understanding is that when we look at this chart, in 1990, we are actually at a point where we begin optimal funding of all of the ongoing projects. In planning, we would look a year or two ahead of that time, in 1989, and start bringing some of those projects that are substantially planned up to snuff so they are ready to either be recommended for approval or recommended not for approval, but bring their planning to completion and get them on the table.

That would begin in 1989 and continue in 1990 and thereafter. I think we have approximately 60 projects in the planning process, but I am not familiar specifically with the one you mentioned, Senator.

I would expect that within 2 years, we would be back to the point of resuming planning. One of the things we ought to be doing is trying to see to it that the good projects get finished and proposed for authorization. The bad projects we should stop spending planning money on. Some new projects, obviously, would start in the planning process.

Senator DOMENICI. Mr. Secretary, let me be very blunt. You can't take a regional office planning function from 54 slots to 6 and maintain that you are going to be in the planning business.

I don't want planning for planning's sake, but that is an impossible posture. What you are really going to do is have no planning for a period of time, and then you are going to have to come back and start some expedited process. I mean, it just can't be; it is unrealistic, even if you think you can do it.

I hope that instead of just numbers, if you really think the administration proposal makes sense and that we really ought to do it, I hope you will show us for the record what is going to happen to the planning process for some good projects that are being studied

Secretary HODEL. We will provide the requested information for the record.

[The information follows:]

### IMPACT OF PROPOSED CHANGES ON PLANNING STAFF IN SOUTHWEST REGION

I am informed that if our budget is reduced to the extent proposed, we would have to go to some type of centralized planning organization. Our planning resources would be directed at fewer studies and the planning organization would be restructured to work more efficiently and effectively. To accomplish this, the planning staff remaining in the Southwest regional office would probably consist of study team leaders who would work with state and local officials, water user organizations, nonfederal study partner(s), etc. Each specific project investigation would be given full consideration by the technical planning staff in an effort to formulate a viable plan. The technical staff would be concentrated in one centralized location for the entire Bureau to provide the necessary study support, thus maintaining a greater variety of technical specialties for the six regional offices through the regional team leaders.

## BRANTLEY DAM, N. MEX.

Senator DOMENICI. Let me talk about one that I am really worried about right now in terms of the availability of funds. We, for a long time, were your star case. We had the Brantley Dam project at a time when there were no other new starts. Your predecessor came out to New Mexico because we finally kicked off a dam project. Construction has been going wonderfully at Brantley Dam in the Carlsbad area. You are familiar with it?

I am concerned because I thought at every level, whether you requested it in your official budget or whether we talked to you privately, that Congress had funded this project to the maximum. Every time we have acted, you have told us it will keep the project going until the next appropriation. I understand now, however, that the Brantley Dam project, fully funded for fiscal year 1987—I know of no reprogramming or other cuts anywhere—is in danger of being shut down for lack of funds.

Is that true? Why is that? And if your answer is that you have literally run out of money and there is nothing else going on, how does it happen that we have this many months left in a fiscal year, and we are going to have to shut a project down or provide a supplemental appropriation?

Mr. DUVALL. Senator, let me answer that, if I may. A couple of years ago, we transferred some money out of the Brantley project because of lack of accomplishment on the part of the contractor. In fiscal year 1987, the contractor has made up that time and is in danger of exhausting the funds that have been allocated in 1987.

That project is to be the beneficiary of $6 million of the reprogramming that we were talking about. We planned on taking something from Garrison, unfortunately, but it is needed to keep the contractor's accomplishment going on Brantley Dam to finish that project.

Secretary HODEL. Senator, in our priorities, Brantley was one of those that will get full funding and be essentially completed in 1988.

Senator DOMENICI. Is that correct?

Secretary HODEL. Yes.

Senator DOMENICI. You have asked for the $23.3 million to complete Brantley Dam in 1988 but for a few million needed for cleanup at the end. I understand that.

But so that we have the record straight, if, in fact, Brantley Dam is $6 million short for this year's work, it is not because it was underappropriated in 1987. As a matter of fact, we appropriated that fully in 1987.

Secretary HODEL. That is right; that is correct.

Senator DOMENICI. The contractor completed his work more rapidly than was expected and also made up some back work. Thus, there is a risk that we will not have sufficient cash for the last 4 months or so of this year. Is that the issue?

Mr. DUVALL. That is correct; that is exactly the circumstance we are facing.

Senator DOMENICI. All right. There is nothing else to it? There is no mismanagement on the part of anybody on the site that you are aware of? The contractor has done his job right; is that right?

Mr. DUVALL. In this instance, the contractor has done a stellar job. He has been doing better than expected.

## NAVAJO DAM, N. MEX.

Senator DOMENICI. Senator McClure was talking about dam safety. I just have a concern in one of my areas.

You have some safety sensors that are rumored to have been removed from the Navajo Dam in the Four Corners area of New Mexico. These sensors give the downstream communities about 2 hours' notice of potential dam failures so the area can be evacuated. According to some of the residents, the sensors have been removed in the last couple of weeks.

Perhaps this action is part of some replacement or refurbishment process, but can you tell us whether this rumor is true? If so, will the sensors be replaced, and if not, why not?

Mr. DUVALL. Senator, I am not familiar with the question of sensors being removed, but we do have a contractor there who is doing the dam safety curtain wall construction work on that dam. When that work is completed, it should not be necessary to maintain those monitoring sensors beyond that point in time.

Senator DOMENICI. Will you check it out for us?

Mr. DUVALL. This is the first I have heard of this point. I would be happy to verify what has taken place there and provide it for the record.

[The information follows:]

### NAVAJO DAM SENSORS

Sensors were installed on seepage-measuring devices which are used to monitor the performance of Navajo Dam and its foundation. The sensors were malfunctioning and were removed last fall. A new system is currently being installed which will automate all of the instrumentation at Navajo Dam. The new system will be operational before May 1.

## ANIMAS-LA PLATA PROJECT

Senator DOMENICI. Mr. Secretary, I have a question about the Animas-La Plata project. I think you know that in order to begin construction on this project, Congress has to enact legislation to implement certain elements of an Indian water rights settlement. I have been informed that the Department will not assist the nonfederal parties in drafting this legislation.

I understand that the nonfederal parties asked for assistance and came to Washington but were refused assistance in drafting the appropriate legislation to settle these very complex Indian water claims, which are an important part of getting the Animas-La Plata project moving ahead.

If this is true, why did we not help them with it? What should we do to make sure that you can help them?

Secretary HODEL. Senator, I can't relate to the representations that have been made to you on that, because the advice I have been given is that we have been participating with those parties in the consideration of what should go into a piece of legislation.

The administration will not propose a bill in that process, but we have, as I understand it, been available for such work. In fact, this budget includes almost $2 million for project activities not subject to the passage of such legislation.

So I have trouble relating to that. There has been, from time to time, misinformation communicated about what our position is on that project. This may be a result of that. But I can't relate to it.

Senator DOMENICI. You know that both Senators in New Mexico and both Senators in Colorado have worked very hard on this project. I would like to make a letter that Senator Bill Armstrong wrote to you, Mr. Secretary, a part of the record. It is a very current letter, dated

March 3. It indicates that on March 2 a meeting was arranged with your people to see if they could help in drafting this legislation. It was supposed to take place, but because someone, one individual person was not there, the nonfederal parties were told that the Department could be of no assistance.

I would hope that you would look into the matter and that we can make arrangements to have the Department look at this legislation. It is very complicated, as you understand, and I am not trying to burden this record.

But if we were to quantify the Indian water rights claims that are being settled there, they could be in excess of $100 million. This is all supposed to be resolved through the Animas-La Plata project.

I assume you are telling us that you have an interest in seeing that the nonfederal parties draft their legislation correctly.

Is that a fair statement, that you want that done, Mr. Secretary, and done right?

Secretary HODEL. We want that drafted properly, you bet, sir. We will be responding to Senator Armstrong's letter. We will, if it is appropriate, supply you with a copy of that, as well.

Senator DOMENICI. I understand that there is $1,955,000 in your budget for the Animas-La Plata project; is that correct?

Secretary HODEL. Yes.

Senator DOMENICI. You initially wanted more than that, $4.3 million, I believe. Are the additional funds that were denied you in this budget critical to moving this project ahead?

Secretary HODEL. I will have to ask the Bureau.

Mr. DUVALL. We are of the opinion that the difference between the $1,955,000 and the amount that our initial budget request represented would not set us back in the completion of the project.

Senator DOMENICI. When will the project begin? Do you have any idea?

Secretary HODEL. Assuming the bill passes?

Senator DOMENICI. Yes; the water rights bill.

Mr. DUVALL. If we get the legislation, then the site work that is being done on Ridge basin reservoir and the abutment and drilling geology work that is included in the $1,955,000 will be folded into the construction costs, and the project will go forward from there.

Senator DOMENICI. Mr. Chairman, if I go on too long, just stop me. Have I already taken too long?

Senator JOHNSTON. You have one more question left. [Laughter.]

## VELARDE COMMUNITY DITCH PROJECT, NEW MEXICO

Senator DOMENICI. Thank you, Mr. Chairman.

I am concerned—and I direct this to the Bureau Chief, with reference to a project in New Mexico known as the Velarde Acequias. Something has gone amiss, because we appropriated $2.2 million in fiscal year 1987, and that funding level, according to what you have told us for the 1987 year, has gone from $2.28 million appropriated to only $783,000 for 1987.

Where did the funds go?

Mr. DUVALL. There was a reprogramming out of that account of $900,000, and there was an assignment of underfinancing to the account of $597,000, for a total of $1,497,000.

Senator DOMENICI. I understand the first part, but what does the second part of your statement mean?

Mr. DUVALL. The underfinancing is a provision that is incorporated into our budget request. In recent years, the rate has been 11 or 12 percent for the construction program and is a deficit number to represent anticipated underaccomplishment on the projects for which monies were appropriated. If the projects actually do encounter slowdowns or if construction is not moved at as rapid a pace as is projected on some of the 60-some-odd projects that are being funded, then the underfinancing is assigned to them. If, on the other hand, projects don't encounter those kinds of slowdowns, then we are faced with reducing allocations to some projects to make up that underfinancing amount, since the appropriation amount is net of the underfinancing.

Senator DOMENICI. That seems like a huge amount of underfinancing to be taken from one project on a percentage basis.

Mr. DUVALL. As a percentage, that would be high.

Senator DOMENICI. What does that mean with reference to the rest of the year? What do you expect to happen? Is part of that going to be made available as you proceed through the year?

Mr. DUVALL. The $783,000 that is left, is that what your question is?

Senator DOMENICI. No, sir.

Mr. DUVALL. What are we going to use that for?

Senator DOMENICI. I had understood that you had reduced Velarde by around $597,000 as part of a programwide reduction. Yet there is a very large sum—$1.497 million—that you have just explained is the underfinanced part. I am merely saying that it doesn't seem logical to me that out of all 60 projects, Velarde would take that big a hit.

Could you check on that and report back to us, so I don't take any more of the committee's time?

Mr. DUVALL. That is fine. We will get a response to your question for the record.

Senator DOMENICI. I would appreciate it.

Mr. DUVALL. The information will be provided.

Senator JOHNSTON. Is that all you have?

Senator DOMENICI. That is all I have, thank you.

[The information follows:]

### VELARDE COMMUNITY DITCH

Fiscal year 1987 underfinancing of $597,000 was assigned to the Velarde community ditch project because additional funds of $586,000 were transferred to the project in fiscal year 1986. These funds covered contractor earnings for construction of diversion structures programmed for fiscal year 1987. Since that work was completed in fiscal year 1986, that funding was not required in fiscal year 1987. Although this may appear to be a high proportion of underfinancing, it is consistent with our normal procedure of applying underfinancing where the funding is not required.

Later in fiscal year 1987, we transferred $900,000 to the Brantley project because of a critical need to fund ongoing contract requirements. There were no surplus funds available from other projects and ongoing work is considered higher priority than new work. Based on that transfer of funds, it will not be possible to award any new contracts for the Velarde community ditch project during the balance of fiscal year 1987.

### KESTERSON RESERVOIR CLEANUP

Senator JOHNSTON. Mr. Secretary, with respect to the $5.6 million transfer from the loan program to Kesterson, was this the dilution technology which was requested by the California State Water Resources Control Board?

Secretary HODEL. No; I don't think so. I think that is the problem we face. We are proposing that, and propose to go ahead with it. We would, in fact, I think, propose to go ahead even if they came out with another proposal if we were permitted to do so.

Senator JOHNSTON. What is their proposal?

Secretary HODEL. Their proposal is to dry up the reservoirs and remove the contaminated soil and anything around that has the selenium on it. Then put it in an on-site disposal of some kind. Presumably, some kind of container that isn't going to be breachable. That alternative is much more expensive.

The thing I am concerned about is that the irrigation district may be uncertain on who is going to pay for this. Obviously, we are looking to the irrigation districts to pay us. When we are talking about a lower cost option, they might be perfectly willing to go along with that. When they are looking down the gun barrel of a very high cost option, they may be unwilling to do that and may seek to restrain us from going forward until several things are resolved. These include whether we are forced to do it, whether we are allowed to charge them for it, and the like.

Senator JOHNSTON. Do you think you are entitled to charge them; to pick the technology and charge them, or must they decide on it in advance?

Secretary HODEL. I better find out whether anybody has gotten a definitive statement since I last asked. When I last asked that question, it was not clear to me that we had a definitive opinion on the part of the Department as to precisely for what we could charge and how.

Whether it would be charged to the capital account or whether it is an operating account expense makes a very great difference to the irrigators. Obviously, they are paying the operating account in the year in which it occurred. They pay the capital account over 30 or 40 years without interest. That makes a very great difference.

Do you have the definitive answer?

Mr. DUVALL. The Solicitor is preparing an opinion at the present time with respect to both the authority for us to go forward with the fix and also the reimbursability of the costs that are incurred in that exercise. That is not out of the Solicitor's Office yet.

Senator JOHNSTON. Could you give us an estimated ballpark figure on the total cost using the two different technologies, the dry technology and the dilution technology?

Mr. DUVALL. The wet flex system would cost $5.6 million in fiscal year 1987, and that is the subject of the supplemental request that we have submitted. The total for the 6-year period of time under the wet flex option would be $17.4 million. If, on the other hand, we have to go to the on-site disposal plan, that would cost about $45 million.

Senator JOHNSTON. By the way, what would happen to the wildlife while you are drying out the refuge?

Mr. DUVALL. Both plans would provide for some mitigation of wildlife by placing fresh water in adjacent areas around the area in order to try to attract and lure the nesting birds and wildlife away from the present Kesterson Reservoir. That is an exercise that is going on now.

## 1988 BUDGET POLICY CHANGES

Senator JOHNSTON. Let me say, Mr. Secretary, and Mr. Duvall, on your total overall budget, we have got a very tough time here. I mean, the reprogramming, for example, takes money right out of the hide of Garrison and other projects. And I understand the WEB project can be finished in 2 years if we funded at the optimum rate. We very much would like to build Central Utah and Central Arizona projects at a more rapid pace. I think it is cost effective to do so.

But the question is: Where do we get the money from without cannibalizing too many of the ongoing projects to which we are committed? That is going to be a great problem for us, as you. If you know where some extra money is [laughter] we would appreciate learning about it.

Do you have any more questions, Senator Domenici?

Senator DOMENICI. With your permission, Mr. Chairman, I think you know how concerned I would be if we had to, in the heart of construction season, shut Brantley down for 4 or 5 months and then start it back up. We are not to that point yet, obviously, but I am concerned that the money has been spent so fast. I am not critical yet, but I hope you are committed to seeing that that doesn't happen. Otherwise you wouldn't be asking for reprogramming; right?

You think we ought to go ahead and finish the year out without closing the site down and reopening it in October, I assume.

Secretary HODEL. That is right; that is why we seek to reprogram, Senator. We are in agreement what ought to be done. I think we can't promise you what we will be able to do.

Senator DOMENICI. Yes; but I do understand that this is not your last cut at what is going on in the field in terms of available monies that could be shifted around that aren't needed. I am merely asking whether you will be doing that on a regular basis and advising us rather than us being surprised by an actual shutdown.

Will you advise us promptly as to any other reprogramming or possibilities if we can't get this one done?

Mr. DUVALL. Yes; we will. We have very little flexibility. In fiscal year 1986, we carried into that year $145 million of unobligated funds, and we reduced our budget request, if you will recall, in order to use carryover. So this fiscal year, we don't have the flexibility that we used to enjoy. We have very little uncommitted construction dollars this year. To reprogram $12.8 million, we had to go to seven projects in order to pick up that amount of money. It seems odd when you have $700 million in the appropriation, but most of it is committed to ongoing projects from the prior year.

ADDITIONAL PREPARED QUESTIONS FOR THE RECORD

Senator DOMENICI. Thank you very much, Mr. Chairman.

Senator JOHNSTON. Thank you very much, Secretary Hodel and Mr. Duvall. There will be additional questions provided for your response. Also, Senator Hatfield, Senator McClure, Senator Garn, Senator DeConcini, Senator Daschle, and Senator Pressler have questions as well.

Thank you, again, Mr. Secretary and Commissioner for your appearance here today. Your testimony has been very helpful.

Secretary HODEL. Thank you, Mr. Chairman.

[The questions and answers follow:]

## QUESTIONS SUBMITTED BY SENATOR JOHNSTON

### SECRETARY OF THE INTERIOR

### Policy Changes

Question: Mr. Secretary, the budget before us for the Bureau of Reclamation has caused a lot of excitement and concern because of major policy decisions regarding project funding and more importantly, the long range future of the Reclamation program.

As structured, the Planning program will be cut by just over 60%; and funding for just 3 activities will consume 68% of all construction dollars and 45% of the entire Bureau of Reclamation budget for fiscal 1988.

What is the reason for such major new policy changes?

Answer: The President's fiscal year 1988 budget for Reclamation reflects the priorities of concentrating Bureau activities on projects that are nearly completed, substantially underway or meet critical needs, while conforming to the target limitations on the budget deficit as established by Public Law 99-177, the Gramm-Rudman-Hollings Balanced Budget and Emergency Deficit Control Act. The proposed FY 1988 budget does not include planning projects that might add to the construction backlog, but recognizes that consideration of these projects should be postponed until that backlog can be reduced.

Question: Who established this "policy" because it does not appear to be consistent with what is proposed in the Corps of Engineers budget? Is this Administration or Departmental policy?

Answer: This is a Departmental policy. Different conditions exist for each agency. Late in the budget preparation process, we in the Department reviewed the manner in which we have been budgeting and Congress has been appropriating funding for Reclamation projects. What we determined is that the approach we have been using results in delaying completion dates on many projects. This means that projects are not getting finished in a timely manner and are incurring excessive additional costs. One of this Administration's policies is to get results and use funds effectively. We believe that our backlog of viable projects can best be attacked by redirecting our efforts and funds on fewer projects in a given year and by postponing planning activities so as not to unduly add to that backlog. OMB agrees with the general policy and we believe strongly that it is the most cost effective way to budget for these projects, although we are perfectly willing to work with Congress on details.

### OMB Projections

Question: What are the five-year OMB projections for annual appropriations for Reclamation activities?

Answer: I am informed that the OMB projections for current and permanent appropriations for the Bureau of Reclamation are for FY 1988, $1,053 million; FY 1989, $1,127 million; FY 1990, $1,141 million; FY 1991, $1,036 million; and for FY 1992, $1,045 million.

Question: What guarantee is there that future ceilings will not be reduced once the major activities proposed in this budget are completed?

Answer: I am advised that these figures are estimates for planning purposes and may be adjusted later, either higher or lower.

## Changes in Planning Program

Question: The request before the Committee for Bureau of Reclamation planning activities is $11.6 million compared to $29.4 million for the current year - a reduction of $17.8 million or over 60% lower than the current level. What will be the personnel impact of such a sizable reduction?

Answer: The Budget proposal is to reduce the total strength of the Bureau planning function by about 275 positions.

Question: How many people will actually be terminated? How much of the reduction can be handled through attrition?

Answer: If Congress approves our fiscal year 1988 proposal, we estimate approximately 150 employees will be separated from the Bureau through reduction-in-force procedures. Approximately 125 of the positions to be eliminated will be unfilled due to normal attrition and retirements.

Question: With no planning function and little work in the pipeline, how long will it be before the Bureau goes out of business?

Answer: There is no intention to put the Bureau out of business or eliminate the planning function. Although the reduction we are recommending is substantial, a planning staff of approximately 200 would continue working on the planning functions. As the construction backlog is sufficiently reduced, the postponed studies will be reinitiated and new studies started.

Question: How will the remaining planning activities be handled?

Answer: Our resources would be directed at fewer studies and the planning procedures would be restructured for more efficient effective operation.

Question: Mr. Secretary, on page 3 of your prepared statement, I note that the Bureau of Reclamation is now proceeding to carry out the Planning program as set out in the 1987 Appropriation Act. Then you make the following point:

> "However, this will have an effect on the FY 1988 budget for the General Investigations Program."

— Could you explain what you mean by that statement?

Answer: This statement refers to the fact that the budget recommendation would require that steps be taken in FY 1987, after receiving concurrence of the committee, to make an efficient transition into FY 1988. This requires slimming down the organization in order to meet the FY 1988 budget level. If the slimming down does not occur in FY 1987, then the unbudgeted costs will be incurred in FY 1988.

## Delayed Project Criteria

Question: Now, the decision was made to focus available construction dollars on construction projects and features "substantially underway while constraining funds for projects in the early stages of construction."

Could you explain to the Committee the process that was used to to determine if a project was "substantially complete?" What specific criteria and factors were used making your determination?

Answer: The basic criteria considered in allocating FY 1988 funding to the various projects include:

1. Meeting ongoing requirements on all projects.
2. Funding Safety of Dams work contracts currently underway at full capability level.
3. Funding environmental analysis and cleanup work on the San Luis Unit, Central Valley Project.
4. Executing new contracts on projects which are substantially underway and with large in-place investments and on which major project benefits with accompanying federal obligation repayment can be accelerated by concentrating construction capability on early or timely completion.
5. Selectively funding new contracts on projects with substantial non-Federal financing.
6. Funding new contracts on projects which meet other Department-wide priorities, such as Indian Claims and benefits.

Use of these criteria will maintain the completion dates on many projects which could otherwise be underfunded year-by-year. When funds become available, the delayed projects could resume construction on optimum schedules.

Question: Do you believe that these decisions were made in a fair and impartial way?

Answer: Yes.

## WEB Project

Question: According to the budget justification material over 67% of the total Federal expenditures required on the WEB Rural Water Project in South Dakota will have been made by the end of the current fiscal year.

Could you explain why the WEB project is one of those being severely cut back?

Answer: The amount allocated to WEB was based on meeting ongoing requirements, and the fact that each unit of the WEB Project goes into service upon completion. WEB's ongoing contracts (those awarded prior to January 5, 1987) required little funding in FY 1988, therefore, the amount allocated was small. The WEB Project consists of discreet subunits for municipal and industrial water service, and the investment is primarily a grant since 75 percent of the cost is nonreimbursable. The combination of these factors led us to conclude that the WEB Project did not meet the criterion necessary to execute new contracts at this time.

## Completion Dates of Construction Projects

Question: Please provide for the record a listing of all those projects or features of projects that are being "slipped" due to the budgetary constraints of the Administration's budget. The table should show the additional cost estimate to be incurred and the value of the lost benefits as a result of the delay.

Answer: The following projects which have identified completion dates, have been delayed due to budgetary constraints: Animas-La Plata; Boulder Canyon; Grand Valley Unit; Paradox Valley Unit; Title I Division, Colorado River Basin Salinity Control Project; Dolores Project; Belle Fourche Unit; North Loup Division; Garrison Diversion Unit; Closed Basin Division, San Luis Valley Project; and WEB Rural Water Development.

We have not prepared an estimate of the cost of the delays or an estimate of savings for earlier completion of work and delivery of benefits on an individual project basis.

Funding in the President's budget is adequate to prevent the termination of any existing contracts or related costs.

Overall, there is no expectation of additional costs resulting from the proposed re-ordering of construction priorities. On a Bureauwide basis, savings are expected. By concentrating funding of fewer projects, the new policy maximizes the dollars devoted to contract construction and reduces the component for project and regional administration with respect to both number of years and percent of budgeted resources. The proposal also completes projects earlier, thereby accelerating the availability of project benefits and repayment to the Treasury.

### Bureau of Reclamation Funding Request

Question: Mr. Commissioner, what level of funding for 1988 did the Bureau of Reclamation initially request within the Department of the Interior?

Answer: The initial request for current and permanent appropriations for the Bureau of Reclamation within the Department of the Interior was made within the FY 1988 planning allowance for the Bureau which was $1,125 million. However, the Bureau identified an overtarget package showing an additional amount of approximately $175 million to maintain project and program schedules.

Question: What was the amount requested for the Bureau of Reclamation in the OMB submission?

Answer: The amount requested in the OMB submission for FY 1988 for the Bureau of Reclamation was $1,132 million.

Question: What amount was approved by OMB and how does that compare with the ~~amount~~ actually included for the Bureau in the budget? If there is a difference, why were these funds diverted from the Bureau of Reclamation and to what programs were they applied?

Answer: Through the formal budget development process, OMB approved the $1,053 million for the Bureau of Reclamation as contained in the President's budget.

### FY 1987 Supplemental Request

Question: The fiscal year 1988 budget includes a supplemental request to transfer $5.6 million from the Loan Fund to initiate the cleanup of Kesterson Reservoir.

Bring the Committee up to date on the current status of the Bureau of Reclamation's effort to resolve the problem at Kesterson.

Answer: On December 1, 1986, the Bureau of Reclamation submitted a Closure and Post-Closure Maintenance Plan (CPMP) to the California State Water Resources Control Board. Since that date, the State Board held hearings on January 26 and 27, 1987, to receive verbal comments from the public. A draft Order, with the preliminary Board decision on the approved method of cleanup for Kesterson Reservoir, was circulated for review on March 2, 1987, and a Board workshop followed on March 5, 1987. The State Board Order regarding the cleanup of Kesterson Reservoir and the San Luis Drain is scheduled to be issued on March 19, 1987. During a 30-day appeal period permitted by the State Board, the Bureau will be reviewing the full impacts of the Board decision prior to initiating implementation of the cleanup of Kesterson Reservoir and the San Luis Drain.

Question: Discuss briefly the various cleanup alternatives proposed and the costs associated with each.

Answer: On October 20, 1986, the Bureau of Reclamation filed with the U.S. Environmental Protection Agency a Final Environmental Impact Statement (FEIS) for the Kesterson Program. The action proposed by the Bureau and subsequently recommended to the State Board in the CPMP was a phased approach, incorporating the implementation of the Flexible Response Plan (FRP), Immobilization Plan (IP), and Onsite Disposal Plan (ODP).

As described in the FEIS and the CPMP, the FRP would include installation of shallow groundwater wells and vegetation control. A detailed monitoring program would be initiated and an extensive program evaluation effort would be conducted during the first fiscal year of program implementation. Wildlife nuisance abatement (such as hazing) to keep wildlife away from the Kesterson Reservoir ponds would continue. In addition, a study would be initiated on the San Joaquin kit fox, an endangered species which would be adversely affected by efforts to clean up Kesterson Reservoir. After periodic review of the FRP, the Bureau of Reclamation, in consultation with the Fish & Wildlife Service, planned to evaluate the effectiveness of the FRP and would present the results of these analyses to the State Board.

If the results of the monitoring of the FRP indicated a need for additional procedures to minimize selenium mobility, the IP would be implemented on the advisement of the State Board. Under the IP, more extensive vegetation control (dry and wet harvesting and disposal) would take place and depth of water in the southern ponds would be increased. The monitoring program and nuisance abatement program instituted under the FRP would continue unchanged under the IP.

At the time of plan development, it was anticipated that the FRP would be in operation for at least one year before the need for immobilization might be warranted by the results of ongoing scientific investigations. If monitoring of the IP indicated that the selenium in water and sediments remained at nuisance levels, the Bureau of Reclamation planned to propose the initiation of the ODP.

The ODP would consist of excavating all sediments and soil, plus associated vegetation, with selenium concentrations above a specific threshold; dry harvesting all remaining above-ground vegetation; and depositing the material in a landfill enclosed with a PVC synthetic membrane or similar material. The State-approved landfill would be located in an area specifically designated within the present Kesterson Reservoir. In addition to the monitoring program, evaluation effort, nuisance abatement, and San Joaquin kit fox study previously identified in the FRP, the on-site disposal alternative would include a leachate collection and disposal system (involving soil grading, collection pump stations, holding tanks, monitors and sensors, and off-site disposal of the leachate). Costs of the ODP are dependent on the amount of contaminated sediments and vegetation excavated.

Current estimates of the cost of each of the various plans through fiscal year 1992 follow:

| Plan | Total Cost (in millions) |
|---|---|
| Flexible Response (FRP) | 17.4 |
| Immobilization (IP) | 17.9 |
| Onsite Disposal (ODP) | 33 - 60 |

Question: What plan has Reclamation recommended to the California State Water Resources Control Board, and why was this particular plan selected?

Answer: The plan which the Bureau of Reclamation recommended to the State Board is a phased approach, incorporating the Flexible Response, Immobilization, and Onsite Disposal Plans as analyzed in the FEIS and presented in the CPMP.

The phased approach was recommended for a combination of the following reasons:

Allows new cleanup technology to be evaluated for potential application to other sites in the West.

Permits continued scientific evaluation of the tolerable limits of selenium concentrations in the Kesterson environment, as well as controls in a natural setting.

Reduces risks to fish and wildlife through nuisance abatement activities.

Potential for substantial cost savings over more conventional cleanup methods (such as landfill).

If the FRP or IP are successful, removes the requirement for continuous management (and associated operation and maintenance requirements) of a landfill facility.

Leaves options open for other cleanup technology.

Allows for consideration of the latest research results.

Question: How, specifically, will the $5.6 million request in the supplemental be used? What are the follow-on costs in FY 1988 and are those funds included in your budget?

Answer: In the CPMP which was submitted to the State Board, the Bureau proposed initial implementation of the Flexible Response Plan (FRP). The plan involves drilling of shallow wells, application of clean water to the southern ponds to reduce primary selenium exposure, and the implementation of a vegetation management program. A comprehensive monitoring program would be implemented as part of the FRP. Components of the monitoring program would address soil, groundwater, surface water, biota, air quality, and public health. An extensive program evaluation effort would be conducted during fiscal year 1987 and nuisance abatement actions (such as hazing) to keep wildlife away from the Kesterson Reservoir ponds would continue. In addition, a study would be initiated on the San Joaquin kit fox, an endangered species which could be adversely affected by the proposed action.

The fiscal year 1987 estimated costs for the FRP are $5,560,000; of this amount, $710,000 would be for the installation of facilities at Kesterson Reservoir and the San Luis Drain and the remainder ($4,850,000) would provide for monitoring, evaluation, and nuisance abatement. Under the FRP, continued operation, monitoring, and nuisance abatement are expected to be $2,766,000 in fiscal year 1988, as requested in the President's FY 1988 budget within the San Luis Unit, Central Valley Project, California.

Question: Are there any indications that the Control Board may not approve the cleanup plan you have recommended? If so, what would be the budgetary impact, both in the current fiscal year and in FY 1988, of initiating a plan other than the one you have recommended?

Answer: Based on information contained in the draft of the Board Order issued for review on March 2, 1987, the State Board may disapprove the implementation of the first two phases of the Bureau's recommended Phased Approach (i.e., the FRP and IP phases would not be approved for implementation). This would result in the Board ordering the Bureau to implement the Onsite Disposal Plan (ODP).

If the ODP is implemented, funding needs would be between $15 million and $20 million in fiscal year 1987 and between $10 million and $25 million in fiscal year 1988, depending on the amount of sediment and vegetation excavated.

Question: Will the Bureau be able to accommodate any additional funding requirements from within available 1987 or proposed 1988 resources? If not, will the Administration make a supplemental request for additional resources to accomplish the required work?

Answer: Reclamation has been unable to identify surplus funds arising from non-budgetary delays in the construction schedules in fiscal year 1987; furthermore, it appears unlikely that such funds would become available from delayed work on other projects during the remainder of fiscal year 1987. Neither does it appear likely that funds would become available during fiscal year 1988 to accommodate the cleanup of Kesterson Reservoir.

At this time, the Administration has no plans for submitting a request for a supplemental appropriation for additional resources for the cleanup of Kesterson Reservoir.

### Small Loan Program/Kesterson Clean Up

Question: I note that the Administration is not requesting funds to finance any new loans during FY 1988 under the Small Reclamation Projects Act of 1956. Are there any loan applications presently pending before the Bureau that would be eligible for funding if funds were available? If so, who are the applicants and what are the amounts involved?

Answer: There are 4 projects with complete or nearly complete loan applications. The sponsors of three of these have submitted final applications and the other has submitted a draft of its application. The projects, the total loan amount and the first year requirement are as follows:

| | Loan and Grant ($ in thousands) | |
|---|---|---|
| Project | Total | 1st year |
| Freeman Diversion Improvement Project<br>United Water Conservation District<br>California | 18,300 | 570 |
| Day Creek Water Project<br>San Bernardino County<br>California | 13,400 | 1,000 |
| Stagecoach Reservoir Project<br>Upper Yampa Water Conservancy District<br>Colorado | 7,400 | 3,000 |
| Middle Creek Dam Project<br>State of Montana<br>Montana | 3,300 | 350 |

The budget request includes a 1987 supplemental request to transfer $5.6 million from unobligated balances in the loan program to initiate cleanup activities at the Kesterson Reservoir.

Question: Are the funds to be expended for the cleanup to be reimbursable under the reclamation law?

Answer: Yes.

Question: If so, who will be subject to the repayment requirements?

Answer: A final decision on this matter is awaiting an opinion from the Solicitor. Under current law, at the discretion of the Secretary of the Interior, the project beneficiaries are subject to repayment requirements.

Question: Were there no loan applications to which this $5.6 million could be applied?

Answer: The Bureau did not have any new loan applications to which the $5.6 million could be applied in fiscal year 1987.

## Loan Program

Question: By letter of December 4, 1986, the Secretary of the Interior transmitted to the Congress a copy of an approved loan application for the United Water Conservancy District, Ventura County California.

- Are there funds available to the Bureau to fund the application?

- I would note that in the letter of transmittal it was stated that: "Funding of the project will probably be dependent upon the passage of legislation to increase the appropriation ceiling in the Small Reclamation Projects Act."

- I would remind you that Public Law 99-546, which increased the appropriation ceiling, was signed into law by the President on October 27, 1986 — almost 6 weeks before the date of the December 4 letter transmitting the District's loan application to the Congress.

Answer: Funding was not included in the Bureau's fiscal year 1988 budget request for any new work, which reflects the decision to concentrate our efforts and funds on the completion of projects.

## Cliff Dam--Safety of Dams

Question. The Administration proposes to use funding authority provided by the Safety of Dams Act for preconstruction activities at Cliff Dam, a feature of the Central Arizona Project. The Budget identifies $7.1 million for preconstruction activities at Roosevelt and Cliff Dam. Under the proposal, how much of this amount would be utilized at Cliff Dam?

- Absent the approval by the Congress of this Budget request, is it your opinion that the Department of the Interior has the authority to utilize funds appropriated for the Safety of Dams program for Cliff Dam?

- In effect, this Administration is asking the Appropriations Committee to authorize the use of Safety of Dams funds for a new dam.

- I recall from both the 97th and 98th Congress, that during the consideration of amendments to the Safety of Dams Act of 1978, the Congress wholeheartedly rejected the concept of authorizing the Secretary of the Interior to utilize Safety of Dams funds for new dams.

In summation, your request is an attempt to supplement the authority granted to the Secretary pursuant to the Safety of Dams Act as amended.

As Chairman of the authorizing Committee, and Chairman of this Subcommittee, I can only tell you at this time that I will take your request under consideration.

Answer. The amount from the Safety of Dams Act authority for Cliff Dam in fiscal year 1988 is $186,000, including $28,000 non-Federal contribution.

The Solicitor's Office stated that the Bureau of Reclamation could spend safety of dams funds on Cliff Dam and that Congress did not foreclose such expenditures when clarifying the intent of the safety of dams legislation in the legislative history.

The Safety of Dams Modification Report for the Salt River Project dams was transmitted to Congress on April 23, 1984, in accordance with the provisions of section 5 of the Act. That report described Cliff Dam and stated that safety of dams funds would be applied toward the construction of Cliff Dam. Congress accepted the report without comment. Additionally, the Central Arizona Project Plan 6 has received Congressionally approved funding for the past several years. Plan 6 contained Cliff Dam and the Safety of Dams Act funding participation in full view, even though actual requests for Cliff Dam itself were not presented until the fiscal year 1988 budget.

## Planning

Question: The Budget as submitted would provide for a severe cutback in planning activities by the Bureau with a reduction in funding as well as personnel. Monetarily, the FY 1988 request reduces the General Investigations budget from $29 million to $11.5 million and the number of personnel from 392 to 180. I recall the testimony before the Committee on Energy and Natural Resources where the Administration testified optimistically that there would be a resumption of planning activities in the early 1990's.

- Realistically, how can you expect to reassemble the experienced planning team that the Bureau presently has after laying off so many personnel?

Answer: Our proposal, in connection with the planning activities, would retain a planning staff of approximately 200 to continue studies closest to completion and the planning functions. As the backlog of projects under construction is reduced, postponed studies will be reinitiated and, if appropriate, new studies started, using the skills and knowledge of the more than 200 core planning staff which would be retained under our proposal. If some increase in that core capability were to be needed in the future, the budget would include the necessary resources.

Question: I would also note that you are summarily ending funding for several feasibility investigations that were specifically authorized by Act of Congress. Have you reviewed this proposal with the Senate sponsors of those studies?

Answer: We are postponing some authorized feasibility studies, but we are not "summarily ending funding for several feasibility investigations that were specifically authorized by Act of Congress." The Bureau has a backlog of projects which are not being completed in a timely manner and which are incurring excessive additional costs. We believe that our backlog of viable projects can best be attacked by redirecting our efforts and funds on fewer projects in a given year and by restructuring our planning activities to not unduly add to that backlog. OMB agrees with the general policy and I believe strongly that it is the most effective way to proceed, although in terms of specifics I am perfectly willing to work with Congress on details.

## Salinity Program

Question: Flows of the Colorado River have been above the normal range for two years. Supplies of water meeting required standards are currently being delivered to Mexico. The proposed budget cuts back on planning and construction activities related to the Colorado River Salinity Control Program. To what extent has this decision to cut back been influenced by the high flows of the Colorado River?

Answer: High flows in the Colorado River Basin since 1983 did not influence our budget decisions on the Colorado River salinity control program.

Question: If planning is cut back and there is a subsequent reduction in flows, and we have difficulty meeting our commitments to Mexico, how will we be able to respond absent completed planning efforts?

Answer: We are currently meeting our water quality commitments to Mexico by bypassing Wellton-Mohawk drain water to the Gulf of Mexico and, when necessary, providing Mexico with water out of storage. The current solution to meeting Mexico's water quality commitment during low flows is through the use of the Yuma Desalting Complex currently under construction.

## QUESTIONS SUBMITTED BY SENATOR DECONCINI

### SECRETARY OF THE INTERIOR

### Construction Criteria

Question: I have carefully reviewed the Department's new policy initiative with regard to the funding of water projects. While the policy of fully funding those nearing completion now and establishing a five year plan to fund others in future years, may make sense from a long term financial standpoint, I would like additional information on how the Department plans to implement this new policy.

For example, what criteria did the Department utilize to determine which projects will be fully funded in fiscal year 1988, and which projects will have funding deferred until future years?

Which projects will be delayed as a result of this new policy? Can you provide a detailed listing of the anticipated completion dates for these projects?

Answer: The basic criteria considered in allocating FY 1988 funding to the various projects include:

1. Meeting ongoing requirements on all projects.
2. Funding Safety of Dams work contracts currently underway at full capability level.
3. Funding environmental analysis and cleanup work on the San Luis Unit, Central Valley Project.
4. Executing new contracts on projects which are substantially underway and with large in-place investments and on which major project benefits with accompanying federal obligation repayment can be accelerated by concentrating construction capability on early or timely completion.
5. Selectively funding new contracts on projects with substantial non-Federal financing.
6. Funding new contracts on projects which meet other Department-wide priorities, such as Indian Claims and benefits.

The following list of projects represent those which are in the "delayed" category. We cannot provide new completion dates at this time since it has not yet been determined when each will be brought back onto an optimum funding schedule. Projects will be moved back into "maintained" status starting as early as fiscal year 1989, and others will be restored year by year as funds become available.

[The information follows:]

### U.S. BUREAU OF RECLAMATION
### DELAYED PROJECTS
($ in Thousands)

| Project | Total Estimated Cost | Cost to 9/30/86 | FY 1987 | FY 1988 |
|---|---|---|---|---|
| Regular Construction | | | | |
| Title I Division, CRBSCP | 468,082 | 292,610 | 21,427 | 23,984 |
| WEB Rural Wtr Development | 100,600 | 45,776 | 21,480 | 2,255 |
| Animas-La Plata Project | 331,791 | 4,729 | 1,202 | 1,955 |
| Columbia Basin, Irrigation | 3,237,052 | 908,535 | 5,689 | 2,870 |
| CVP, Auburn-Folsom South | 2,109,613 | 340,393 | 1,438 | 1,000 |
| Pick-Sloan Missouri Basin: | | | | |
| Garrison Diversion Unit | 1,177,531 | 256,411 | 31,686 | 2,500 |
| Belle Fourche Unit | 48,415 | 2,725 | 3,900 | 980 |
| North Loup Division | 348,610 | 182,235 | 13,869 | 19,470 |
| O'Neill Unit | 173,200 | 7,211 | 482 | 0 |
| Boulder Canyon Project | 17,461 | 3,640 | 4,160 | 1,415 |
| Title II Division, CRBSCP: | | | | |
| Las Vegas Wash Unit | 113,500 | 7,755 | 485 | 0 |
| Paradox Valley Unit | 82,757 | 20,086 | 10,188 | 11,383 |
| Grand Valley Unit | 251,396 | 48,160 | 8,363 | 8,525 |
| San Luis Valley,Closed Bsn | 92,600 | 54,866 | 10,640 | 4,085 |
| CVP, San Felipe Division | 342,501 | 275,638 | 10,096 | 7,000 |
| Dolores Project | 302,577 | 255,018 | 14,232 | 11,047 |
| Arbuckle, D&MC | | | 311 | 346 |
| Boise, Arrowrock Dam, D&MC | | | 150 | 0 |
| CRFW&LS, D&MC | | | 16,385 | 6,242 |
| Cultural Res. Activities, D&MC | | | 413 | 50 |
| Leadville Mine Drainage, D&MC | | | 50 | 50 |
| Lower Colo Water Supply, D&MC | | | 100 | 0 |
| Oahe Unit, D&MC | | | 65 | 65 |
| Regional Complex, D&MC | | | 54 | 0 |
| Velarde Community Ditch, D&MC | | | 783 | 717 |
| Weber Basin, D&MC | | | 160 | 124 |
| Sect 8 (excludes Dallas Creek) | 345,702 | 137,343 | 6,259 | 991 |
| Preconstruction Activities | | | | |
| Spring Creek | 1,380 | 0 | 20 | 0 |
| Colo Riv Bridge Crossing | 929 | 123 | 56 | 0 |

## Deferred Contract Costs

Question: Will there be contract costs associated with the halt of construction on projects where funding is being deferred? If so, what is the total estimated cost to the government?

Answer: On projects where funding is being deferred, the FY 1988 request is sufficient to fund all ongoing contracts. We have adequately funded those projects in the budget request to prevent any contract terminations. Therefore, we don't expect any contract costs associated with implementing this funding approach.

## Funding Impact on Water Projects

Question: I assume curtailment in construction activities will affect Bureau of Reclamation personnel. How will BOR staffing be affected by this new proposal?

Answer: Curtailment of construction activities because of the new policy is not expected to affect staffing except for the Garrison Diversion Unit. It is estimated that a shift of emphasis at the Garrison Diversion Unit in Bismarck will result in a reduction of the current staffing total of 150 employees to one of about 50 employees over a two year period. Over this period, we could expect about 20 of those positions to become vacant due to normal attrition. Keeping with long-standing Bureau policy, we would offer employment at other locations to qualified employees whose skills were needed. For the remainder and those who do not want to relocate, we would offer placement assistance, severance pay and discontinued service retirement to ease the transition.

Question: As you know, Mr. Secretary, traditionally, western reclamation states have joined together in support of sufficient funding for all reclamation projects in the west. This new policy, it would seem to me, has the effect of eliminating that unity and results in one state being pitted against the other. What has been the reaction to this policy in the West?

Have the major water organizations and Governors whose states would lose in FY 88 endorsed the Administration's new water policy?

Answer: The new policy relating to the Bureau's planning and construction programs was available to the public through the submission of the FY 1988 President's Budget. We made our proposal in an effort to complete studies and projects in the shortest time and, therefore, at lower costs: general goals which I think we all share. However, because it would result in temporarily postponing some projects, there have been many questions about the policy and its application to particular projects and studies. Regardless of whether this particular budget policy is adopted, we will make every effort to ensure that the traditional unit of the past is not disrupted. We anticipate that most, if not all, issues can be resolved with the States and water organizations.

## Fiscal Year 1988 Capability

Question: How much additional funding would be needed for the Bureau of Reclamation's FY 88 budget to keep all reclamation projects whole and on schedule? Could you provide a detailed listing on funding requirements?

Answer: The amount which would be needed in fiscal year 1988 to put all projects on an efficient engineering schedule would total $1,182,214,000 which is $177,059,000 above the budget request of $1,005,214,000. We recommend that Congress appropriate the FY 1988 President's Budget amount for the Bureau.

(The table follows:)

### DEPARTMENT OF THE INTERIOR
### BUREAU OF RECLAMATION

### Additional Capability for Projects in the FY 1988 Budget

(dollars in thousands)

| Appropriation/Project | Fiscal Year 1988 Request Federal | Fiscal Year 1988 Request Non-Fed | Fiscal Year 1988 Request Total | Capabilities Submitted Federal | Capabilities Submitted Non-Fed | Capabilities Submitted Total | Total Capability Federal | Total Capability Non-Fed | Total Capability Total |
|---|---|---|---|---|---|---|---|---|---|
| GENERAL INVESTIGATIONS | | | | | | | | | |
| Project Investigations | | | | | | | | | |
| Alamogordo | 0 | 0 | 0 | 200 | 0 | 200 | 200 | 0 | 200 |
| Colorado River System Management Alternatives Study | 0 | 0 | 0 | 250 | 250 | 500 | 250 | 250 | 500 |
| Colorado River Water Quality Improvement Program: | | | | | | | | | |
| Price-San Rafael Rivers Unit | 125 | 0 | 125 | 200 | 0 | 200 | 325 | 0 | 325 |
| Program Coordination and Support Activities | 0 | 0 | 0 | 577 | 0 | 577 | 577 | 0 | 577 |
| San Juan River Unit | 0 | 0 | 0 | 300 | 0 | 300 | 300 | 0 | 300 |
| Support Division | 0 | 0 | 0 | 175 | 0 | 175 | 175 | 0 | 175 |
| Uinta Basin Unit | 0 | 0 | 0 | 600 | 0 | 600 | 600 | 0 | 600 |
| Environmental and Interagency Coordination Activities | 0 | 0 | 0 | 625 | 0 | 625 | 625 | 0 | 625 |
| Four Corners Water Assessment | 0 | 0 | 0 | 150 | 150 | 300 | 150 | 150 | 300 |
| Groundwater Recharge Demonstration | 0 | 0 | 0 | 250 | 62 | 312 | 250 | 62 | 312 |
| Investigation of Existing Projects | 0 | 0 | 0 | 500 | 0 | 500 | 500 | 0 | 500 |
| Mesa-Delta M&I Ground Water Study | 0 | 0 | 0 | 220 | 0 | 220 | 220 | 0 | 220 |
| Minor Work on Completed Project Investigations | 0 | 0 | 0 | 55 | 0 | 55 | 55 | 0 | 55 |
| Northern Nevada Water Augmentation | 0 | 0 | 0 | 80 | 0 | 80 | 80 | 0 | 80 |
| Northwest Oklahoma | 0 | 0 | 0 | 300 | 10 | 310 | 300 | 10 | 310 |
| Offstream Storage Investigation, CVP | 0 | 0 | 0 | 363 | 363 | 726 | 363 | 363 | 726 |
| Prairie Bend Unit | 0 | 0 | 0 | 100 | 20 | 120 | 100 | 20 | 120 |
| San Bernardino Valley Ground Water | 0 | 0 | 0 | 200 | 200 | 400 | 200 | 200 | 400 |
| San Diego County Wastewater Management | 0 | 0 | 0 | 40 | 40 | 80 | 40 | 40 | 80 |

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

Additional Capability for Projects in the FY 1988 Budget

(dollars in thousands)

| Appropriation/Project | Fiscal Year 1988 Request |  |  | Capabilities Submitted |  |  | Total Capability |  |  |
|---|---|---|---|---|---|---|---|---|---|
|  | Federal | Non-Fed | Total | Federal | Non-Fed | Total | Federal | Non-Fed | Total |
| GENERAL INVESTIGATIONS (continued) |  |  |  |  |  |  |  |  |  |
| Sevier River Water Management | 0 | 0 | 0 | 100 | 100 | 200 | 100 | 100 | 200 |
| Southeast Oklahoma | 0 | 0 | 0 | 350 | 50 | 400 | 350 | 50 | 400 |
| Southern Nevada Water Study | 0 | 0 | 0 | 638 | 638 | 1,276 | 638 | 638 | 1,276 |
| South Platte-Frenchman Project | 0 | 0 | 0 | 125 | 125 | 250 | 125 | 125 | 250 |
| Spring Canyon Pumped Storage Project | 0 | 0 | 0 | 450 | 450 | 900 | 450 | 450 | 900 |
| Technical Assistance to States | 0 | 0 | 0 | 175 | 0 | 175 | 175 | 0 | 175 |
| Upper Rio Grande Basin Water Supply | 0 | 0 | 0 | 300 | 150 | 450 | 300 | 150 | 450 |
| Yakima River Basin Water Enhancement | 0 | 0 | 0 | 710 | 0 | 710 | 710 | 0 | 710 |
| General Engineering and Research |  |  |  |  |  |  |  |  |  |
| Atmospheric Water Resources Management | 497 | 2,317 | 2,814 | 3,265 | 0 | 3,265 | 3,762 | 2,317 | 6,079 |
| Advance Planning |  |  |  |  |  |  |  |  |  |
| Central Valley Project: |  |  |  |  |  |  |  |  |  |
| Kellogg Unit Reformulation | 0 | 0 | 0 | 75 | 200 | 275 | 75 | 200 | 275 |
| Colorado River Water Quality Improvement Program: |  |  |  |  |  |  |  |  |  |
| Lower Virgin River Unit | 0 | 0 | 0 | 75 | 75 | 150 | 75 | 75 | 150 |
| Price-San Rafael Rivers Unit | 0 | 0 | 0 | 200 | 0 | 200 | 200 | 9 | 200 |
| Uinta Basin Unit | 0 | 0 | 0 | 250 | 0 | 250 | 250 | 0 | 250 |
| San Jacinto | 0 | 0 | 0 | 200 | 25 | 225 | 200 | 25 | 225 |
| Umatilla Basin Project | 0 | 0 | 0 | 365 | 0 | 365 | 365 | 0 | 365 |
| TOTAL, G. I. CAPABILITIES | 622 | 2,317 | 2,939 | 12,463 | 2,908 | 15,371 | 13,085 | 5,234 | 18,310 |

### DEPARTMENT OF THE INTERIOR
### BUREAU OF RECLAMATION

### Additional Capability for Projects in the FY 1988 Budget

(dollars in thousands)

| Appropriation/Project | Fiscal Year 1988 Request Federal | Fiscal Year 1988 Request Non-Fed | Fiscal Year 1988 Request Total | Capabilities Submitted Federal | Capabilities Submitted Non-Fed | Capabilities Submitted Total | Total Capability Federal | Total Capability Non-Fed | Total Capability Total |
|---|---|---|---|---|---|---|---|---|---|
| CONSTRUCTION | | | | | | | | | |
| Regular Construction | | | | | | | | | |
| Boulder Canyon Project | 1,415 | 0 | 1,415 | 8,800 | 0 | 8,800 | 10,215 | 0 | 10,215 |
| Central Valley Project: | | | | | | | | | |
| Auburn-Folsom South Unit | 1,000 | 0 | 1,000 | 500 | 0 | 500 | 1,500 | 0 | 1,500 |
| San Felipe Division (Watsonville) | 0 | 0 | 0 | 200 | 0 | 200 | 200 | 0 | 200 |
| San Luis Unit | 17,944 | 825 | 18,769 | 225 | 275 | 500 | 18,169 | 1,100 | 19,269 |
| Trinity River Restoration | 5,105 | 0 | 5,105 | 1,000 | 0 | 1,000 | 6,105 | 0 | 6,105 |
| Columbia Basin, Irrigation Facilities | 2,870 | 0 | 2,870 | 1,600 | 0 | 1,600 | 4,470 | 0 | 4,470 |
| Indian On-Farm Dist. Systems, CAP | 0 | 0 | 0 | 1,200 | 0 | 1,200 | 1,200 | 0 | 1,200 |
| Pick-Sloan Missouri Basin Program: | | | | | | | | | |
| Belle Fourche Unit | 980 | 0 | 980 | 3,400 | 0 | 3,400 | 4,380 | 0 | 4,380 |
| Garrison Diversion Unit | 2,500 | 2,000 | 4,500 | 42,000 | 0 | 42,000 | 44,500 | 2,000 | 46,500 |
| North Loup Division | 19,470 | 100 | 19,570 | 1,000 | 0 | 1,000 | 20,470 | 100 | 20,570 |
| O'Neill Unit | 0 | 0 | 0 | 500 | 50 | 550 | 500 | 50 | 550 |
| WEB Rural Water Development Project | 2,255 | 800 | 3,055 | 20,000 | 0 | 20,000 | 22,255 | 800 | 23,055 |
| Drainage & Minor Construction | | | | | | | | | |
| Ainsworth Unit, P-SMBP | 0 | 0 | 0 | 600 | 0 | 600 | 600 | 0 | 600 |
| Chief Joseph, Oroville-Tonasket | 4,040 | 0 | 4,040 | 400 | 0 | 300 | 4,340 | 0 | 4,340 |
| Colorado River Front Work/Levee System | 6,242 | 0 | 6,242 | 13,510 | 0 | 13,510 | 19,722 | 0 | 19,722 |
| Fryingpan-Arkansas Project | 8,100 | 0 | 8,100 | 2,500 | 0 | 2,500 | 10,600 | 0 | 10,600 |
| Safety of Dams | | | | | | | | | |
| Newlands Project, Lake Tahoe Dam | 94 | 0 | 94 | 366 | 0 | 366 | 460 | 0 | 460 |

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

Additional Capability for Projects in the FY 1988 Budget

(dollars in thousands)

| Appropriation/Project | Fiscal Year 1988 Request |  |  | Capabilities Submitted |  |  | Total Capability |  |  |
|---|---|---|---|---|---|---|---|---|---|
|  | Federal | Non-Fed | Total | Federal | Non-Fed | Total | Federal | Non-Fed | Total |
| CONSTRUCTION (continued) |  |  |  |  |  |  |  |  |  |
| Preconstruction Activity |  |  |  |  |  |  |  |  |  |
| Colorado River Bridge Crossing | 0 | 0 | 0 | 100 | 1,400 | 1,500 | 100 | 1,400 | 1,500 |
| Colorado River Salinity Control Project |  |  |  |  |  |  |  |  |  |
| Las Vegas Wash Unit, Title II Division | 0 | 0 | 0 | 1,600 | 0 | 1,600 | 1,600 | 0 | 1,600 |
| Paradox Valley Unit | 11,383 | 0 | 11,383 | 2,750 | 0 | 2,750 | 14,133 | 0 | 14,133 |
| Title I Divison | 23,984 | 0 | 23,984 | 4,041 | 0 | 4,041 | 28,025 | 0 | 28,025 |
| Colorado River Storage Project |  |  |  |  |  |  |  |  |  |
| Animas-La Plata Project | 1,955 | 0 | 1,955 | 4,200 | 0 | 4,200 | 6,155 | 0 | 6,155 |
| Dolores Participating Project | 11,047 | 0 | 11,047 | 4,000 | 0 | 4,000 | 15,047 | 0 | 15,047 |
| Recreation & Fish and Wildlife | 3,836 | 0 | 3,836 | 16,434 | 0 | 16,434 | 20,270 | 0 | 20,270 |
| TOTAL, CONSTRUCTION CAPABILITIES | 124,220 | 3,725 | 127,945 | 130,926 | 1,725 | 132,551 | 255,016 | 5,450 | 260,466 |

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

Additional Capability for Projects in the FY 1988 Budget

(dollars in thousands)

| Appropriation/Project | Fiscal Year 1988 Request Federal | Non-Fed | Total | Capabilities Submitted Federal | Non-Fed | Total | Total Capability Federal | Non-Fed | Total |
|---|---|---|---|---|---|---|---|---|---|
| OPERATION AND MAINTENANCE | | | | | | | | | |
| Central Valley Project | 34,872 | 0 | 34,872 | 12,130 | 0 | 12,130 | 47,002 | 0 | 47,002 |
| Colorado-Big Thompson Project | 6,998 | 456 | 7,454 | 540 | 0 | 540 | 7,538 | 456 | 7,994 |
| Fryingpan-Arkansas Project | 1,705 | 0 | 1,705 | 175 | 0 | 175 | 1,880 | 0 | 1,880 |
| Parker-Davis Project | 2,412 | 761 | 3,173 | 155 | 118 | 273 | 2,567 | 879 | 3,446 |
| Pick-Sloan Missouri Basin Program: | | | | | | | | | |
| Kansas River Area | 988 | 0 | 988 | 170 | 0 | 170 | 1,158 | 0 | 1,158 |
| North Platte Area | 7,854 | 771 | 8,625 | 540 | 0 | 540 | 8,394 | 771 | 9,165 |
| Upper Missouri Area | 6,246 | 162 | 6,408 | 350 | 0 | 350 | 6,596 | 162 | 6,758 |
| Yuma Area Projects-Consolidated | 19,151 | 0 | 19,151 | 2,795 | 0 | 2,795 | 21,946 | 0 | 21,946 |
| TOTAL, OPERATION AND MAINTENANCE | 80,226 | 2,150 | 82,376 | 16,855 | 118 | 16,973 | 97,081 | 2,268 | 99,349 |
| LOAN PROGRAM | | | | | | | | | |
| Small Reclamation Projects Act Loans | | | | | | | | | |
| Middle Creek Dam Rehabilitation Proj. | 0 | 0 | 0 | 50 | 295 | 345 | 50 | 295 | 345 |
| San Bernardino County - Day Creek | 0 | 0 | 0 | 5,000 | 0 | 5,000 | 5,000 | 0 | 5,000 |
| Stagecoach Reservoir Project | 0 | 0 | 0 | 6,265 | 2,483 | 8,748 | 6,265 | 2,483 | 8,748 |
| United Water Conservation District | 0 | 0 | 0 | 5,500 | 0 | 5,500 | 5,500 | 155 | 5,655 |
| TOTAL, LOAN CAPABILITIES | 0 | 0 | 0 | 16,815 | 2,778 | 19,593 | 16,815 | 2,933 | 19,748 |
| TOTAL, ALL APPROPRIATIONS | 205,068 | 8,192 | 213,260 | 177,059 | 7,529 | 184,488 | 381,997 | 15,885 | 397,873 |

## Central Arizona Project

Question: There have been charges levelied by certain opponents of the CAP that the Inspector General has found the CAP frought with major financial deficiencies. Could you provide for the record a complete response to the initial findings made by the Inspector General and tell the Committee which issues have been resolved and which issues remain outstanding? If any items have not been resolved, can you tell the Committee when the Department plans to come to an agreement on those items?

Answer: The Department's Inspector General (IG) submitted the Final Audit Report, "Review of the Status of the Central Arizona Project, Bureau of Reclamation" on April 4, 1986. The following is an outline of the report and the responses to the report provided to the Inspector General.

Item 1. PLAN 6 AUTHORIZATION
IG Finding: The cost of Plan 6 exceeds the indexed cost of Orme Dam significantly and, therefore, is not authorized.
IG Recommendation: Advise the Congress and request additional appropriation ceiling.
Response: I responded to this item by deciding that there was no need to seek additional appropriation authority from the Congress due to the fact that cost estimates for the entire Central Arizona Project did not exceed overall appropriation ceiling authority.

Item 2. REPAYMENT CONTRACT
IG Finding: Reclamation's current estimate of Central Arizona Water Conservation District's (CAWCD) repayment obligation of $2 billion exceeds CAWCD's repayment obligation ceiling of $1.2 billion.
IG Recommendation: Reclamation should immediately obtain a contract amendment that covers the CAWCD's increased repayment obligation.
Response: The response to this item was provided by Reclamation and included an action plan for the initiation of negotiations with CAWCD.

Item 3. APPROPRIATION CEILING
IG Finding: Reclamation's computation of the fiscal year 1986 appropriation ceiling of $3.57 billion includes approximately $175 million of unsupported or questionable costs.
IG Recommendation: Reclamation should eliminate or exclude general legislation costs from all future ceiling computations, unless the costs can be supported by verifiable data.
Response: This item was responded to by Reclamation which concurred that the appropriation ceiling would be adjusted for any amount associated with mathematical errors. In addition, Reclamation initiated a process of reevaluating general legislative costs to ensure that the costs can be supported with verifiable data.

Item 4. INITIATION OF REPAYMENT
IG Finding: Reclamation could increase the Government's economic benefits by at least $25 million if New Waddell Dam was placed in repayment status when completed.
IG Recommendation: Reclamation should include New Waddell Dam in a repayment stage that closely relates to the time it is completed and in operation. Include an agreement for the staged repayment of CAP in the contract amendment increasing CAWCD's repayment ceiling.
Response: This item was responded to by Reclamation which agreed to negotiate terms in the amended master repayment contract that will address staged repayment, including New Waddell Dam.

Item 5. EXCESS CAPACITY IN GRANITE REEF AQUEDUCT
IG Finding: CAWCD is responsible for repayment of the capital

cost allocable to excess capacity in the Granite Reef Aqueduct. Reclamation has allocated such costs to both reimbursable and nonreimbursable functions without recognizing that all the costs allocable to excess capacity are reimbursable by CAWCD.
IG Recommendation: Reclamation should revise its cost allocation procedures to ensure that all costs allocable to excess capacity in the Granite Reef Aqueduct are repaid by CAWCD.
Response: This item was responded to by Reclamation and the IG recommendation was adopted.

Item 6. GRACE PERIOD
IG Finding: The Government could incur over $10 million in interest costs over the CAP repayment period because CAWCD's repayment contract provided that no penalty will be assessed on delinquent annual payments until 30 days after the due date.
IG Recommendation: Reclamation should revise CAWCD's repayment contract to eliminate the 30-day grace period.
Response: This item was responded to by Reclamation. Removal of the 30-day grace period was agreed to by Reclamation which is to be accomplished during the renegotiation of the master repayment contract with CAWCD.

Item 7. ADJUSTMENTS OF WATER DELIVERY ESTIMATES
IG Finding: CAWCD's repayment contract provided for allocation of water supply capital costs between M&I and irrigation functions at 7-year intervals.
IG Recommendation: Reclamation should amend CAWCD's repayment contract to retroactively adjust the capital allocations on an annual basis.
Response: This item was responded to by Reclamation which stated that this item will be part of the renegotiation agenda to insure that the reimbursable costs of the CAP will be properly recovered.

Item 8. AD VALOREM TAXES
IG Finding: When computing the ad valorem tax revenues needed to meet CAWCD's repayment obligation, Reclamation did not consider that the District's taxing authority is limited to a specific rate.
IG Recommendation: Reclamation should include in the CAP repayment analysis a supplemental schedule that identifies both the estimated amount of ad valorem revenues required and the estimated amount that will be available on an annual basis.

Response: This item was responded to by Reclamation which pointed out that the studies in question show that adequate ad valorem tax revenues will be available. In addition, it was stated that Reclamation would continue to provide CAWCD with analyses indicating the amount of ad valorem taxes which will be required, and let CAWCD determine how it should derive its revenues to make payments to the United States.

Item 9. CENTRALIZED PROJECT ACTIVITY COSTS
IG Findings: The Lower Colorado Region of Reclamation does not adjust the estimated base used to allocate centralized project activity costs to actual at year end.
IG Recommendation: Reclamation should amend its centralized project activity allocation instructions so that allocations are based on actual year-end costs or data. The CAP allocations for prior years should then be revised, based on the amended instructions.
Response: This item was responded to by Reclamation which agreed to the IG recommendation.

On September 19, 1986, the Inspector General stated that items 1, 2, and 8 had been resolved. On December 12, 1986, the Inspector General stated that the additional information and clarification provided on November 20, 1986, met the intent of the remaining items.

**Question.** There has been considerable discussion over the past year or two on the use of Safety of Dams funds for construction of new or replacement dams. An Associate Solicitor at the Department opined in December of 1985 that the Congress intended the use of SOD funds for construction of new or replacement dams if the costs to meet safety requirements was the most cost-effective approach. The GAO, four months later in April of 1986 refuted the Solicitor's opinion. Presently, what is the Federal government's policy on the use of SOD funds to construct new or replacement dams? Do you anticipate any change in this policy in the near future?

**Answer.** The Solicitor's Office stated that the Bureau of Reclamation could spend safety of dams funds on Cliff Dam, a replacement dam, and that the Congress did not foreclose such expenditures when clarifying the intent of the safety of dams legislation in the legislative history. Specifically, the Safety of Dams Act is not being used as authority for construction of a replacement dam, but is contributing funding to construct a dam already authorized by other legislation, and for which there would be a significant safety of dams collateral purpose. We would not expect any change in this policy.

Question: A number of environmental organizations have filed suit in Federal court in Phoenix alleging that the Department of the Interior failed to comply with the National Environmental Policy Act in approving Plan 6. Can you update the Committee on the status of that lawsuit?

Answer: The complaint, filed September 19, 1985, alleged that the EIS for Plan 6 was inadequate in that all alternatives in the draft EIS included Cliff Dam. In response to public comment, Reclamation added an alternative to the final EIS, Plan 9, which did not include Cliff Dam. Plaintiffs contend that there should have been a supplemental draft EIS including Plan 9, so that the public would have had an opportunity to comment on its merits.

The next year was spent assembling the administrative record and trying to reach agreement with plaintiffs over its content. In late November 1986, plaintiffs filed a motion for Preliminary Injunction (PI) and several other motions relating to the content of the administrative record. The PI motion was deferred pending rulings on the other motions, including a Motion to Amend the Complaint which was filed December 12, 1986. This motion would raise two new issues, in addition to the procedural NEPA issue raised in the original complaint. There are: (1) that there is significant new information developed by the Corps of Engineers (regarding Salt River channel hydraulics) which requires the preparation of a supplemental EIS, since it affects the flood control benefits of the project and (2) that Plan 6 is not a "suitable alternative" to Orme since it greatly exceeds it in size, scope, and cost and the cost also exceeds the ceiling authorized for Orme Dam.

A hearing is scheduled for March 27, 1987, to determine whether these new issues will be added to the complaint. Motions relating to discovery and the administrative record will then be dealt with, leading to a hearing on the PI Motion, if appropriate, sometime after June 1, 1987.

## San Carlos Project (BIA)/Coolidge Dam

**Question.** Mr. Secretary, over the years, I have had continuing correspondence and contact with you on safety of dams modifications and power generation needs at Coolidge Dam in Arizona. To date, we have not been able to satisfactorily resolve the long-term SOD, powerplant rehabilitation, and maintenance needs at the project. Now, when there is a great deal of interest in the divestiture of the San Carlos Project, both on and off-reservation, information necessary to implement such a move is not available because of a lack of funding, resources, and coordination by the BIA. I hope you can provide answers to the following questions:

What needs to be done to transfer jurisdiction over safety of dams modifications to the Bureau of Reclamation?

Answer. I am informed that there is no need to transfer jurisdiction over Coolidge Dam safety of dams work from the Bureau of Indian Affairs to the Bureau of Reclamation. Reclamation has performed inspections and analytical work for the Bureau of Indian Affairs as well as design and construction management for the recent outlet works rehabilitation and switchyard relocation work. As the Bureau of Indian Affairs requires technical assistance, the Bureau of Reclamation will continue to be available.

Question. From the report the BOR is preparing on safety of dams repairs at Coolidge, what information will be available at the close of Fiscal Year 1987, how much funding is necessary in FY 88 to continue the SOD modification report, and how much is necessary to complete the report by Fiscal Year 1990?

Answer. The current Coolidge Dam study effort is expected to be complete by June 1988. Funds in the amount of $500,000 are available to complete the study. The identification of available alternatives for corrective action will not be known at least until January 1988.

Question. Why were no funds requested to continue the SOD modification report in FY 88?

Answer. Current funds are sufficient for completing the Coolidge Dam study, which is underway.

Question. Is a corrective action report sufficient to undertake long-term SOD repairs at Coolidge?

Answer. For Coolidge Dam, the current corrective action study should provide the Bureau of Indian Affairs sufficient information to make a management decision regarding the need and extent of any corrective action, if necessary. However, it must be pointed out that Coolidge Dam ranks as number 168 in the Department of the Interior Dam Safety Priority List, and there are several dams on which we would expect to work before Coolidge Dam.

## Coolidge Dam Extension Unit

Question: How much money is necessary to complete the power generation rehabilitation efforts at Coolidge? How much has been spent to date?

Answer: It is estimated that $2,438,900 would provide intermediate rehabilitation of the present generators. This would result in another 12 years of life for the power system. We estimate that less than $50,000 has been expended to date.

## San Carlos Project

Question: When will the Department rule on the rate increase request from the San Carlos Irrigation and Drainage District for the San Carlos Project?

Answer: The process is currently underway for the rate increase request to be published in the Federal Register. If there are no problems in the review and publication, the rate could be effective by June 1, 1987.

Question: How timely can an inventory of the property comprising the San Carlos Project be completed and at what cost? Can you provide this information if the work was done by the BIA and if the work was contracted out?

Answer: Curently, the BIA is undergoing a complete inventory and mapping of the electric power system at the San Carlos Project. The current projection is that the work will take 18 months to complete (March, 1987 thru October, 1988). The current estimate for doing the work by BIA staff is $200,000.

Question: Do you have funds and resources necessary to complete this assessment in Fiscal Year 1987? If not, how much is necessary?

Answer: Funds in the amount of $200,000 are available to complete the inventory and mapping of the electric power system by October, 1988.

## Central Arizona Project

Question. I understand the $275 million requested for the CAP is the full capability of the Bureau of Reclamation for this project in FY 88. I applaud the Bureau's initiative and success in getting this full funding request before the Congress. I assume that with that type of capability, the Bureau will be able to meet the water delivery schedule to Tucson, Arizona by 1991. Is my assumption accurate?

Answer. Reclamation expects that a limited amount of Central Arizona Project water will be available in early 1991 to meet the City of Tucson's construction schedule for its water treatment facilities. Reclamation expects to be able to make full water deliveries to the Tucson area in late 1992. This is the date presented in the FY 1988 Budget Justifications and is based on the legal requirements contained in the Southern Arizona Water Settlement Act.

Question. The budget justification states that water deliveries to northern Pima county and the Tucson area are scheduled for "1989 and late 1992, respectively". Has the delivery schedule slipped to 1992 with the combined FY 87 and FY 88 budgets?

Answer. The schedule of water deliveries to northern Pima County and the Tucson area have not slipped between the FY 1987 and FY 1988 Budget Justifications. A limited amount of water will be available in FY 1991 to meet Tucson's construction schedule for its water treatment facilities. Full water deliveries are scheduled to be made to the Tucson area in 1992.

Question. In order to comply with the provisions of the Cost-Sharing Agreement entered into by water interests in the State of Arizona and the Federal government, how much money is necessary in FY 88 to meet the schedules outlined in that agreement?

Answer. The FY 1988 funding request will provide adequate funding to insure that the schedules established by the cost-sharing agreement are met.

Question. If reductions were made, and I hope they are not, can you tell the Committee how any reduction for the CAP would affect the Bureau's overall program to maintain schedules and let major contracts?

Answer. If a reduction were made on the Central Arizona Project, the reductions would be assigned in accordance with the cost-sharing agreement. Plan 6 would be reduced first, followed by distribution systems, and finally Tucson Aqueduct.

Question. The budget justification includes $84.7 million for the Regulatory Storage Division of the CAP. You indicate that preconstruction activities and studies will continue on New Waddell, Modified Roosevelt, and Cliff Dams. Can you point out specifically what preconstruction activities will be undertaken at each structure and at what amount?

Answer. Preconstruction activities at each dam include all design dat gathering activities, preparation of designs and specifications, environmental and archeological activities, and land acquisition. The following information is provided for each dam.

At New Waddell Dam, the major preconstruction activities will include acquisition of land and rights for the damsite and reservoir, collection of design data, preparation of specifications and environmental and archeological activities. The cost of preconstruction activities in FY 198 is estimated to be $3,000,000.

At Modified Roosevelt Dam, the major preconstruction activities will include collection of additional design data, preparation of designs and specifications, and environmental and archeological activities. The cost o preconstruction activities in FY 1988 is estimated to be $5,093,000.

At Cliff Dam, the major preconstruction activities will include establishment of a project management team, collection of design data, and envirnmental and archeological activities. The cost of preconstruction activities in FY 1988 is estimated to be $1,085,000.

Question. I note that $3.6 million has been requested under the Safety of Dams authority to continue work on modified Roosevelt Dam and Cliff Dam. Could you detail for the record specifically what work will be undertaken at each structure and at what funding level?

Answer. The FY 1988 program for all activities at Modified Roosevelt Dam and Cliff Dam is $21,716,000. This includes $20,445,000 for Modified Roosevelt Dam and $1,271,000 for Cliff Dam.

The work to be undertaken and the total funding levels are as follows:

Modified Roosevelt:

| | |
|---|---|
| Construction of Highway 188 Bridge | $9,000,000 |
| Construction of Foundation Drainage Adits | 3,667,000 |
| Fish and Wildlife Activities | 443,400 |
| Environmental Mitigation and Studies | 912,500 |
| Highway 88 and Apache Trail Relocation | 1,522,000 |
| Non-Contract Costs | 4,900,100 |
| Total | $20,445,000 |

Cliff Dam:

| | |
|---|---|
| Fish and Wildlife Activities | $209,000 |
| Environmental Mitigation and Studies | 62,500 |
| Non-Contract Costs | 999,500 |
| Total | $1,271,000 |

This program is funded from two Federal sources and three local sources. The Federal sources include the Central Arizona Project, $9,086,000, and the Safety of Dams Program, $3,630,000. The local sources include Salt River Project, $3,476,000; Maricopa County Flood Control District, $3,524,000; and the cities of Phoenix, Scottsdale, Chandler, Glendale, Mesa, and Tempe, $2,000,000.

The total SOD Program at Cliff Dam is $186,000 and at Roosevelt Dam is $6,920,000. As stated above, Federal funding from the SOD Program requested for fiscal year 1988 is $3,630,000 and the local funding of

$3,476,000 is provided by the Salt River Project. The Federal portion at Cliff Dam is $158,000 and the local portion is $28,000. The Federal portion at Modified Roosevelt Dam is $3,472,000 and the local portion is $3,448,000.

Question. I understand $186,000 of the above amount is to be used for engineering and environmental studies on Cliff Dam. Could you more fully explain what these funds will be used for?

Answer. The FY 1988 program for all activities at Cliff Dam is $1,271,000. This program is funded from two Federal sources and three local sources. The Federal sources include the Central Arizona Project, $1,085,000 and the Safety of Dams Program, $158,000.

The total SOD program at Cliff Dam is $186,000. Federal funding from the SOD Program is $158,000 and the local portion is $28,000.

The total program will continue environmental studies on fish and wildlife, endangered species, and archeological and historical studies; preconstruction activities and allow for the establishment of a design team.

Question: How much money has been contributed to the Special Escrow Account established for the upfront cost-sharing agreement so far? Can you tell the Committee how much money will be placed in that account in FY 88 and from what sources? Have funds been drawn from that account and if not, can you tell the Committee when you anticipate a drawdown would occur?

Answer: Through February 1987, a total of $21,450,000 has either been paid directly to Reclamation, or deposited in the escrow account for work under Plan 6 of the Central Arizona Project and the Safety of Dams program.

In FY 1988, a total of $33.9 million will be placed in escrow by the following Arizona entities: Central Arizona Water Conservation District, $21 million; Maricopa County Flood Control District, $3.7 million; Salt River Project, $3.2 million; and the cities of Phoenix, Scottsdale, Chandler, Glendale, Mesa, and Tempe, $6 million.

Through February 1987, a total of $6,120,193 has been either withdrawn from the escrow account or advanced directly to Reclamation. Drawdown of the escrow account occurs on a quarterly basis.

Question. At the close of FY 87, what percentage of completion will the Bureau have attained on the Central Arizona Project? At the requested funding level for FY 88, can you provide this same information? How about Plan 6?

Answer. The estimated completion percentage for the Central Arizona Project at the end of FY 1987 will be 53 percent and at the end of FY 1988 it will be 60 percent. The estimated completion percentage for Plan 6 at the end of FY 1987 will be 8 percent and at the end of FY 1988 it will be 17 percent. The completion percentage for Plan 6 includes Safety of Dams work at Stewart Mountain Dam.

Question: Does the Bureau anticipate any carry-over balance in FY 87?

Answer: The Bureau does not anticipate any carryover of FY 1987 funds.

Question. Under what specific authorization basis did the Bureau include the costs for Indian Distribution systems in the Colorado River Basin Project Act?

Answer. In the Colorado River Basin Project Act (Public Law 90-357), almost $20 million of the $832,180,000 authorized by Section 309. (a) is identified in the legislative history for the construction and rehabilitation of irrigation systems for distributing Central Arizona Project (CAP) water to central Arizona Indian reservation farm lands. This Act also addresses the irrigation and drainage districts in Sections 304.(a), 304.(b)(1), and 402.

Question. What is the status of the contracts for the Indian Distribution systems?

Answer. Central Arizona Project (CAP) Indian water delivery contracts were executed on December 11, 1980, between the Secretary of the Interior for the United States and nine central Arizona Indian tribes. The tenth such contract is under study by the Gila River Indian Community, and negotiations have been held between the Community and Reclamation to clarify language in the contract. It is anticipated that the Community will elect to sign their contract by the end of 1988.

Repayment contracts for the operation, maintenance, and replacement of the IDD systems have been drafted and reviewed. The first of these contracts was successfully negotiated and executed between Reclamation and the Ak Chin Indian Community in 1986 to allow funding to be advanced for the CAP laterals being constructed on the Ak Chin Indian Reservation.

Indian Self Determination and Education Assistance Act (Public Law 93-638) contracts have been executed with three of the Indian tribes that have contracted for CAP water. The first of these contracts was executed April 1984 with the Tohono O'Odham Nation (formerly the Papago Tribe of Arizona). It provides for the Nation to plan their CAP and Southern Arizona Water Rights Settlement Act systems at San Xavier and Schuk Toak. A second contract with the Nation is being prepared for completing the planning. Also, contracts with the Nation are being prepared specifically for design and for construction of the planned works. Under the contract with Salt River Pima-Maricopa Indian Community, they are preparing a development plan to fully utilize their CAP water. Under a contract with the Ak Chin Indian Community, they are designing and constructing their on-reservation CAP facilities.

Question: The Budget justification states that the planning report for the Salt River Pima-Maricopa Indian Community has not been completed and, therefore, the construction schedule will slip one year. Can you explain why the planning report has not been completed?

Answer: The planning report cannot be finalized until several issues are resolved. First, discussions are ongoing with the Salt River Pima-Maricopa Indian Community which may change the use of its Central Arizona Project water entitlement and the configuration of the distribution system, including how Central Arizona Project water is to be integrated with the Community's other sources of water. Issues concerning the reserved water rights of the Salt River Reservation are still under consideration. These issues are expected to be resolved this year followed by completion of the planning report in 1988.

Question: I am concerned about the water delivery schedules for the City of Prescott. Can you update the Committee on the progress being made on the environmental studies on the Verde River that will allow water exchanges?

Answer: Studies are in progress to determine the possible environmental impacts that would be caused by diversions from the Verde River. Originally, these studies were to be completed in February 1987. However, this date has been changed to August 1987. After these studies are completed, Reclamation will seek an opinion from the Fish and Wildlife Service to determine if these diversions will impact the Federally identified threatened and endangered species, the bald eagle and the spikedace (a small minnow).

Question: Footnote 11 in your justification discusses nonreimbursable costs. How much authorization does the Bureau have for Charleston Dam? Can you explain the $100 million in nonreimbursable costs attributed to Charleston Dam?

Answer: Authority for Charleston Dam was contained in the Colorado River Basin Project Act of 1968. The original estimate for Charleston Dam was $36,420,000. Our current estimate is $101,499,000. At this time, Reclamation does not expect Charleston Dam will be built as a feature of the Central Arizona Project and, as a result, is carrying the costs in the nonreimbursable category. Reclamation is evaluating whether the functions of Charleston Dam have already been absorbed within the Tucson Aqueduct.

Question: I understand discussions have been underway with the Central Arizona Water Conservation District to amend the repayment contract. What is the status of those negotiations?

Answer: The formal basis of negotiation is expected to be submitted to the Washington office within the next few weeks. Formal negotiations with the Central Arizona Water Conservation District will start following approval of the basis of negotiation.

## Colorado River

Question: What is the status of the Colorado River Floodway Task Force authorized by Public Law 99-450?

Answer: The Charter for the Task Force was signed by the Secretary on January 23, 1987, and filed on February 2, 1987. The Secretary, by letter dated March 11, 1987, requested the names of individuals representing the various agencies be provided so they can be appointed to the Task Force before the first meeting, which is expected to be held in early spring.

Question: Do you expect to be able to comply with the reporting dates mandated under that law? If no, please explain?

Answer: Subsection 4(c) of the Act requires the Task Force to file its report within 9 months after the date of enactment of the Act. This establishes a report date of July 8, 1987. Due to the requirements of the Federal Advisory Committee Act (P.L. 92-463), the first meeting of the Task Force will not be held prior to mid-April. Therefore, it seems unlikely that the Task Force will be able to file a final report by this date.

Section 11 of the Act requires that within 1 year after the date of the enactment of the Act, the Secretary is to prepare and submit to the congressional committees a report regarding the Colorado River Floodway, the Task Force's report, and the Secretary's recommendations with respect to the objectives of the areas in which the Task Force is to make recommendations. That report and recommendation(s) will be due by October 8, 1987. If the Task Force is late with its report, it will be unlikely that the Secretary can complete the reviews and report by the required due date.

Question: With the heavy snows that fell this winter in the Upper Basin, what is the Bureau's prediction with regard to flows down the Colorado River? Is there any reason to anticipate flows along the levels of those experienced in 1983?

Answer: The forecast for the upper Colorado River Basin ranges between 80 and 110 percent of normal. The seasonal precipitation for October through February for the Upper Basin is between 50 and 80 percent of normal. The snow surveys obtained early in March indicate the mountain snowpack is much below average in the Upper Basin, and near or slightly above average in the southern drainages.

The mid-March forecast for the April-July inflow into Lake Powell was decreased by 0.3 million acre-feet (maf) from the previous forecast for an estimated 7.2 maf. This forecast is 89 percent of the normal spring runoff.

The potential for flooding during the spring snowmelt is low at this time. The tributary stream flows are expected to be below normal, therefore, the flows along the mainstream will be well below the high flows of recent years.

Question: If the BOR expects heavier than normal flows, does the Bureau anticipate alteration of operations of the dams along the River to accommodate these flows?

Answer: A Federal-State technical work group was formed in May 1986 to explore issues of concern related to the operating criteria for the river system. Also, the work group was to formulate procedures to develop and analyze annual operating plans.

During the fall and winter months, the Bureau considered the volume of water in the reservoirs and projected the most probable spring runoff flows to determine if flood control releases would be required. As a result, flood control releases were made from November through February. Since flood control releases are not required with the present forecast, the releases being made are only to meet the scheduled downstream water requirements.

## Buttes Dam

Question: Last year during Appropriation Committee hearings, I asked questions about a reevaluation of the cost/benefit ratio on Buttes Dam. The Bureau stated that a new study looking at additional benefits would be completed by September 1986. Has that study been completed?

Answer: The study reevaluating the Buttes Dam benefit/cost ratio has not been completed. The study has been delayed because of unforeseen complexities involving analyzing sediment damage reduction benefits that would result from the construction of Buttes Dam. Currently, we are working in close cooperation with the Gila River Indian Community, the San Carlos Irrigation and Drainage District, and the Soil Conservation Service to accurately quantify this important component of benefits to be derived from Buttes Dam. Our current schedule calls for completing the reanalysis in July of this year. Following the economic studies, a decision can be made on the need to continue the planning and environmental clearance process for Buttes Dam.

Question: What were the conclusions of the Bureau?

Answer: Until the reevaluation is complete, even preliminary conclusions would be inappropriate.

Question: Why is the Bureau using an interest rate higher than the authorized rate of 3.25 percent for the Central Arizona Project?

Answer: Reclamation is using a higher discount rate for the reevaluation of Buttes Dam because the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G), require the use of the current rate. The guidelines, which are promulgated in accordance with the Water Resources Planning Act of 1965, require that all "pre- or post-authorization project formulation or evaluation studies undertaken by a Federal Agency" comply with the P&G. Hence, the reevaluation of Buttes Dam will utilize the current rate of 8.875 percent.

## Spring Canyon Pumped Storage Project

Question: As you know, the Congress earmarked $800,000 in Fiscal Year 1987 to initiate a feasibility study on the Spring Canyon Pumped Storage Project in Arizona. I understand that while the Department did not send a rescission proposal to the Congress on this project, no funds will be apportioned to the study in Fiscal Year 1987. There is a great deal of private support for this project in Arizona, California and New Mexico and a willingness to contribute 50 percent of the costs for the feasibility study. How does the Department justify the withholding of funds on this project in FY 87?

Answer: The initial apportionment for the General Investigations Program for fiscal year 1987 allowed $270,000 for the Spring Canyon Pumped Storage Study in Arizona. On March 10, 1987, the Office of Management and Budget approved a new apportionment document for the General Investigations Program which allowed full funding of $800,000 as approved by the Congress for this project. The Bureau of Reclamation is proceeding with work on this study.

Question: Under what authority is the Department withholding these funds in the absence of a rescission proposal?

Answer: The Department did not withhold any funds in the General Investigations appropriation but did limit use of funds on this study based on the apportionment document approved by the Office of Management and Budget on November 13, 1986. On March 10, 1987, the Office of Management and Budget approved a new apportionment document for the General Investigations Program which makes all the funds available for this study.

Question: What is the capability on this project in Fiscal Year 1988?

Answer: Although funds were not requested for this project in the Bureau's fiscal year 1988 budget, the Bureau has the capability to utilize $450,000 in Federal funds and $450,000 in non-Federal funds to complete the final planning design and process the draft environmental impact statement.

## Yuma Groundwater Tables

Question: After the major releases of water from dams along the Colorado River in the summer of 1983, the Bureau agreed, along with FEMA, to install nine wells in the Yuma area to reduce the very high groundwater tables. These wells have been successful in reducing groundwater tables in the areas in which they were placed. However, high groundwater tables are still prevalent in the Yuma area and causing significant problems for farming and public works projects. How many of the original Bureau wells are still operating and who pays the costs for operation and maintenance of these wells?

Answer: Currently, only one of the five Bureau wells in the Yuma Valley is in operation and it is scheduled to be shut off in the very near future. The two wells on the California side of the Colorado River and the well in the Gila Valley have also been shut off.

Reclamation is only responsible for the operation and maintenance costs associated with the wells that it constructed. Yuma County is responsible for the operation and maintenance costs associated with the four FEMA wells. Power costs for all wells in the Yuma Valley are paid by Yuma County, except the well near the Yuma Desalting Plant which is paid for by Reclamation.

Question: A recent study completed by the Bureau of Reclamation concluded that additional drainage wells are needed in the Yuma area. In a report entitled, "Study for Additional Drainage Wells in the Yuma Valley", the BOR developed three alternative plans for resolving the groundwater drainage problems. All plans require additional wells and substantial Federal participation in the installation of the wells. Does the BOR plan to implement the findings outlined in the Yuma well study?

Answer: Reclamation currently is evaluating the available alternatives.

Question: Do you have sufficient funds in your Fiscal Year 1987 budget to undertake urgent work in the near future? If not, can you estimate how much it would cost to implement a reasonable approach to the drainage problem?

Answer: There are no funds budgeted for this work in FY 1987. Reclamation is currently evaluating the available alternatives. Preliminary estimates range from zero cost to a cost of $3.5 million for the various alternatives.

Question: Are there adequate funds in the FY 88 budget request for this purpose? If not, how much would be required?

Answer: No funds for Yuma drainage work have been budgeted. The amount of funds required would depend upon (1) the alternative selected, (2) the cost-sharing arrangements, and (3) the duration of the program.

Question: Yuma County officials have indicated a willingness to share in the costs of operating and maintaining any new wells. However, they have requested the use of 1.5 megawatts of Parker-Davis Project power at project power rates to provide necessary energy. To date, the BOR has not made that allocation. Can you tell the Committee what the status of that request is, if there are any institutional problems with granting that allocation, and when a final determination will be made on this subject?

Answer: On November 25, 1986, the Yuma County Board of Supervisors requested that Reclamation do a study for additional Yuma Valley drainage wells. There is an offer of cost-sharing between Yuma County and the Federal Government for power and/or operation and maintenance of these additional wells. We are currently in the process of reviewing that offer to determine the appropriateness of Federal involvement in any additional drainage wells in the Yuma Valley area.

In February 1984, Reclamation requested the Western Area Power Administration (Western) to withdraw 1.5 megawatts of capacity from those Parker-Davis Project power customers having an allocation of withdrawable power for use in operating the wells constructed by Reclamation in 1984 which were recommended by the Yuma Flood Control Task Force. On March 1, 1984, Western provided the required 2 years written notice of impending withdrawal to those power customers. On an interim basis until Parker-Davis Project capacity and energy could be withdrawn, Reclamation entered into an agreement with the Imperial Irrigation District and the Arizona Public Service Company to serve the drainage wells. On March 1, 1986, the 1.5 megawatts of capacity and energy were made available by Western for project purposes upon a seasonal 30-day notice.

In January 1987, after consultation with the Yuma Projects Office, we decided not to operate the wells due to receding of groundwater levels and elected not to request the 1.5 megawatts of capacity for this summer's operation. Should the groundwater wells require operation after March 1987 through September 1987, Western will supply the power required through its fuel replacement program until October 1987, at which time we will request the use of the 1.5 megawatts of capacity or such portion thereof as may be needed. We are not aware of any institutional problems relating to the allocation. However, that allocation of capacity and energy is limited to its use for government-owned wells constructed and operated for Reclamation project purposes.

## Other Projects

Question: What is the Bureau's full capability in Fiscal Year 1988 for Headgate Rock Dam, Colorado River Front Levee work, the Gila Project, the Pima County/Santa Cruz River Groundwater Recharge Project, and the Yuma Desalinization Project?

Answer: The Bureau's fiscal year 1988 capability for these projects is as follows:

| | |
|---|---|
| Headgate Rock Hydroelectric Project | $17,333,000 |
| Colorado River Front Work/Levee System | 19,722,000 |
| Gila Project | 944,000 |
| Pima County/Santa Cruz River Groundwater Recharge Project | 300,000 |
| Yuma Desalinization Project (Colorado River Basin Salinity Control Project, Title I Division) | 28,025,000 |

These numbers represent the Bureau's fiscal year 1988 budget request, with the exception of Colorado River Front Work/Levee System, which includes additional capability of $13,510,000, and the Colorado River Basin Salinity Control Project, Title I, which includes $4,041,000 of additional capability.

## Atmospheric Water Resources Management Program

Question. The Bureau has requested $497,000 for the "Project Skywater" program in fiscal year 1988. This follows an appropriation of $5.7 million for atmospheric water resources research in FY 87. While I recognize that the suspension of funds for this program reflects the Department's new overall philosophy on water development, I am having a difficult time understanding why we would want to terminate a program that has substantial promise to augment water supplies through cloud seeding, etc. The Federal investment to date has been $125.7 million. After this kind of Federal investment in this program, isn't it a shortsighted policy to abandon this program before we have any long-term beneficial results?

Answer. A FY 88 budget of $497,000 is in accordance with the Administration's policy of postponing planning and research studies in favor of construction projects relatively close to completion. Requested funding will allow the Bureau to maintain a core capability in weather modification.

The Bureau is not abandoning this promising non-structural water management program; rather, it intends to transfer the technology to non-Federal beneficiaries whenever possible. Beginning in FY 1989, Bureau involvement in precipitation augmentation programs will be contingent on local interest as indicated by their commitment to cost sharing.

## QUESTIONS SUBMITTED BY SENATOR HATFIELD

### Umatilla Basin Project, Oregon

Question: Update the Committee on the current status of the Umatilla River Basin Project, including any activities to be undertaken during the remainder of FY 1987.

Answer: A Planning Report/Draft Environmental Statement identifying a recommended plan was prepared in 1986 and the 90-day formal public and agency review has been completed. A public hearing was held in Pendleton, Oregon, where statements consistently favored the recommended plan. Some reviewers are concerned over a difference in fishery benefits between Reclamation's report and benefit analyses done by the Oregon Department of Fish and Wildlife for Bonneville Power Administration. The Bureau is working with State and Federal fishery agencies and the Confederated Tribes to reconcile those differences so the Planning Report/Final Environmental Statement can be completed.

In addition to completing the Planning Report/Final Environmental Statement, work in FY 1987 will include: advance planning studies with emphasis on early implementation of the West Extension pumping facilities; coordination with the Oregon Water Resources Department and others on water exchange permits and agreements; working with Bonneville Power Administration to coordinate elements of the Northwest Power Planning Council's Fish and Wildlife Program with the project; and providing information to the Umatilla Basin Project Steering Committee.

Question: Last year, the Congress provided $234,000 for advanced planning to accelerate the completion of the planning stage. Please outline in detail how these funds will be spent and the activities being undertaken with estimated completion dates.

Answer: Advance planning funds for FY 1987 are being used to accelerate final site selection, design data collection and initiation of specifications design work on the high-priority West Extension pumping plant, and to refine engineering and hydrology data on other plan features.

Final site selection and design data collection for the West Extension pumping facilities is scheduled to be completed in the fourth quarter of FY 1987. Advance planning funds are not included in the FY 1988 budget request, and specifications design work on the pumping facilities, as previously scheduled, will be deferred.

Question: How much is needed in FY 1988 to complete the planning and design on each phase of the project?

Answer: $365,000 could be used in FY 1988 to complete specifications designs on the West Extension pumping facilities; to draft operating agreements for this facility; and to continue coordination activities on the project. Of this amount an estimated $250,000 would be required for the specifications design work.

Question: Assuming the Congress provides full funding, when do you anticipate having a planning report/FES available on which Congress can base a project authorization?

Answer: The Planning Report/Final Environmental Statement will be completed in FY 1987 with available funds. A bill to authorize construction of the project (S.2931) was introduced in Congress October 16, 1986, on the basis of information contained in the Planning Report/Draft Environmental Statement and the September 1986 public hearing record. Congress adjourned prior to action on the bill.

Question: A major feature of the preferred plan is a water exchange between the Columbia River and the Umatilla River. Please explain this proposal in more detail.

Answer: The existing Federal Umatilla Project provides irrigation water to lands within the Hermiston, West Extension, Stanfield, and Westland Irrigation Districts. Under present conditions, there is insufficient water in the Umatilla River to meet water service commitments and achieve instream flow improvements sought by the Confederated Tribes and fishery agencies. In the recommended plan, irrigators would reduce diversions from the Umatilla River and forego use of much of the storage in existing reservoirs so that river flows could be improved for fish migration, spawning and rearing. Those reduced diversions and foregone storage water would be replaced to the irrigators by pumping from the Columbia River. On an average annual basis, about 40,000 acre-feet of water would be pumped by project facilities. The first phase of the project involves construction of the West Extension pumping facilities to improve flows in the lower Umatilla River below Three Mile Falls Diversion Dam. The large Columbia River pumping complex would be constructed as the second phase.

Question: Please outline regional, state and local support for the project.

Answer: The Confederated Tribes, State and Federal fishery agencies, Umatilla Basin Project Steering Committee, Oregon Water Resources Department, and Northwest Power Planning Council support the project. The basin's irrigation districts have been supportive of the planning program, and want to cooperatively resolve water conflicts in the basin provided that their water supply is protected.

This proposed project is part of a comprehensive program to restore the Umatilla River Basin anadromous fishery. Substantial non-Federal funding commitments are being made under the Pacific Northwest Electric Power Planning and Conservation Act of 1980 and programs of the State of Oregon, the Indian tribes and other entities. A number of fishery improvement facilities for the basin have been approved or are under consideration for non-Federal funding under the Northwest Power Planning Council's Fish and Wildlife Program. These facilities represent a potential investment of $15 million. To date, $17 million of non-Federal funds have been expended, and additional projects costing about $5 million are in the final design stage. Fish passage and screen facilities included in Reclamation's plan have potential for funding under the Council's Fish and Wildlife Program.

Additionally, it is proposed that electric power to operate project pumping facilities be provided from the Federal Columbia River Power System with the power users repaying the cost of the power.

## Savage Rapids Dam, Oregon

Question: There is a long-standing debate over the Savage Rapids Dam which diverts irrigation water from the Rogue River and continues to be an impediment to anadromous fish passage.

Please give the Committee a brief history of this problem over the last 10 years.

Answer: Savage Rapids Diversion Dam, privately-constructed and operated by Grants Pass Irrigation District, was rehabilitated by the Bureau in 1955. In 1971, Public Law 92-199 authorized the Bureau to study ways to modernize the irrigation district's system and improve fish passage facilities at the diversion dam. A proposal for interim fish passage improvements was completed, and in 1974 Congress authorized construction of these improvements in Public Law 93-493. The construction appropriation ceiling was set at $850,000, and on a nonreimbursable basis. The interim measures are in place, except for north fishway improvements which have been deferred because of excessive costs.

There have been frequent discussions among resource agencies regarding further actions to improve fish passage, but the issue has not been seriously pursued since a 1979 Reclamation report on options. In recent years, private interests have wanted to build a hydropower plant at the dam and this would affect fishway design. Debate over the issue discouraged further fish studies. Efforts to change Oregon law, which has prohibited power development on the Rogue River, have not been successful and power development at the site is not likely. Fishery interests now express interest in addressing the passsage problem but would like a reevaluation of options including dam removal.

Question: How much federal funding has been provided in each of the last 10 years for studying this problem?

Answer: Funding over the last 10 years has been provided as follows: 1977--$56,000, 1978--$181,000, 1979--$66,000, 1980--$48,000, 1981--$29,000, 1982--$89,000, 1983--$5,000, 1984-1987--$0. It is important to note that these funds were used by Reclamation to investigate both fisheries and irrigation problems related to Grants Pass. The expenditures after 1979 were primarily irrigation related.

Question What were the findings and/or proposed solutions to the investigations?

Answer: Two basic options considered in the 1979 Reclamation report involved further improvements to existing facilities and removal of the dam. Removal or breaching of the dam would require an alternative means of providing water to the irrigation district. If the dam remains in place, improvements could include replacement of the north fishway, reconstruction of the south fishway, enlargement of screens, and spillway modifications.

Question: What would be the impact of removing the dam? What local interests and state agencies are proponents and opponents of this approach?

Answer: From a fisheries standpoint, removal would eliminate passage restrictions and operation, maintenance and replacement costs of fish facilities. From an irrigation standpoint, removal would require an alternative means of diverting water. The U. S. Fish and Wildlife Service, National Marine Fisheries Serivce, and Oregon Department of Fish and Wildlfie favor dam removal. Some local and national conservation groups have advocated removal. Opposition to dam removal has been voiced by property owners adjacent to the pool behind the dam. Any program that would threaten water supplies or add capital or annual costs to its operation would be opposed by the irrigation district.

Question: What other alternatives have been discussed?

Answer: If the dam remains in place, improvements could include replacement of the north fishway, reconstruction of the south fishway, enlargement of screens, and spillway modifications.

Question: Other than budget constraints, why has the Bureau not requested funds in FY 1986, FY 1987, or FY 1988 to study this problem?

Answer: Efforts to construct hydropower facilities at the dam discouraged efforts to address fishway problems since hydropower development could alter physical and operations characteristics of the dam and present different financial responsibilities for fishery measures. Also, fishery agencies have been observing operation of interim facilities in light of today's Rogue River fishery conditions to determine what the best remaining actions might be. Dam removal is favored by fishery agencies and there has been reluctance by those agencies to recommend further fishery improvements at the site until this option is reevaluated.

Question: What plans does the Bureau have to remedy this problem?

Answer: Issues related to the Grants Pass area are complex. The irrigation district has deep concerns over its water rights, the aging system, and a changing water market. Fishery agencies favor removal of the district's main water supply diversion. Simple solutions are not available. Proposals to remove the diversion dam must consider what alternative diversion plan could be instituted to meet changing district needs. An understanding of what near and long-term district needs are is a prerequisite to formulating an alternative river diversion. Likewise, to proceed with an immediate program to improve existing fish facilities may find such facilities abandoned in the near-term if practical options to the present diversion dam can be found. Reclamation has discussed a cooperative effort with those concerned about fish passages and water supply problems facing the irrigation district. Those groups recognize that to arrive at a long-term solution will require that a clear definition of options and hard choices be made. Provided that an appropriate program to share study costs and responsibilities is identified, Reclamation could reschedule this work as early as FY 1989.

## Deschutes River Basin Water Salvage Investigation, Oregon

Question: Explain the purpose and need for the Deschutes River Basin Water Salvage investigation.

Answer: Low seasonal streamflows in reaches of the Deschutes River adversely impact instream values of economic importance to central Oregon, including recreation opportunities, the fishery, and aesthetic appeal, and long-standing irrigation withdrawals from the river below Bend, Oregon, result in flow depletion. Conversely, releases from storage during the irrigation season result in high flows in the river above Bend.

A major contributor to these high and low flows is water loss in the irrigation water conveyance systems. Water loss is largely due to geological characteristics and system design. By making improvements in the conveyance systems, water use efficiency can be improved and instream flows can begin to be stablilized at more desirable levels. The investigation would be a cooperative effort with the Oregon Water Resources Department and local entities to develop a pilot program to reduce irrigation conveyance losses and to alleviate problems asosciated with unacceptable instream flow levels and water shortages.

Question: What is the total estimated cost and duration of this study?

Answer: The study was programmed as a new start in FY 1987 to extend over 3 years with a Federal cost of $350,000. FY 1987 funds were budgeted at $50,000. Reclamation's proposed FY 1988 budget does not include funds for the investigation. FY 1987 work will consist of discussions with local groups regarding problems, needs, and study concepts.

## Northern Douglas County Cooperative Water Resources Study, Oregon

Question: Describe the purpose of the Northern Douglas County Cooperative Water Resources Study.

Answer: The study is a cooperative effort with Douglas County planning officials. The study encompasses two tributary basins of the Umpqua River--Elk Creek and Calapooya Creek. Based on studies to date, it appears that storage is needed in each basin to alleviate shortages of municipal and industrial and irrigation water. Low summer streamflows have affected water quality and resident and anadromous fish resources. In addition, flood control is needed in the Elk Creek Basin.

The first phase of this study has concentrated on defining potential solutions to Elk Creek Basin problems, and alternative plans are being formulated for the basin. Similar activities would follow for the Calapooya Creek Basin.

Question: What is the total estimated cost of the study? How much is needed in 1989 to complete the study? Can this investigation be completed in 1988?

Answer: FY 1987 funds in the amount of $215,000 are being used to formulate alternative plans for the Elk Creek Basin, and to identify broad options for Calapooya Creek Basin to assist the county in its program strategy. Federal funds totaling $170,000 would be needed in FY 1988 to complete a plan formulation document on Elk Creek Basin. In FY 1989, $60,000 would be needed to complete a planning report/draft environmental statement for the Elk Creek Basin. Conceptual work now being done in the Calapooya Creek Basin will provide information for the county to make a decision on whether or not to move ahead with investigations on that basin. Funding needed for investigation of the Calapooya Creek Basin has not been determined.

### Tualatin Project, Oregon

Question: Please update the Committee on your problem with the road around Henry Hagg Lake.

Answer: Construction work to repair the road around Henry Hagg Lake, caused by six major landslides, was completed in October 1985. A landslide inspection conducted on December 15, 1986, found no evidence of any new road damaging movements associated with the six major landslides. Small localized slide activity has occurred due to excessive rainfall and inherent instability of the soils; however, the movements are not deep seated and do not jeopardize the immediate stability of the road.

## QUESTION SUBMITTED BY SENATOR McCLURE

### Kesterson Cleanup Alternative, "Wet Flex" Method

Question: Is the money spent on Kesterson "wet flex" wasted if we shift to another program?

Answer: To date, the funds expended for Kesterson have been for research, the collection and analysis of data, and for the planning activities which culminated in the Environmental Impact Statement and the Closure and Post-Closure Maintenance Plan. No funds have yet been used for the implementation of any cleanup method; therefore, no funds to date would be considered "wasted".

If the "wet flex" technology were implemented but proved unsuccessful, the resources incurred during "wet flex" phase would not be directly applicable to the onsite disposal alternative.

## QUESTIONS SUBMITTED BY SENATOR GARN

### Bonneville Unit, Central Utah Project

Question: The Department has indicated that its FY 1988 budget proposal for the Bureau of Reclamation is premised on focusing resources on those projects substantially underway and which can be finished and begin repayment in the near term. With this in mind, what project features of the Bonneville Unit of the Central Utah Project (CUP) need to be completed to provide water deliveries and, thus, begin project repayment?

Answer: Features that need to be completed to provide municipal and industrial water deliveries are Jordanelle Dam and Reservoir and all items of the Diamond Fork Power System. Features that need to be completed to provide irrigation deliveries and start repayment from irrigation are Wasatch Aqueduct and Laterals, Beer Creek Channelization and Laterals, Mona Dam, Mona-Nephi Canal, Pumping Plants and Associated Laterals, Elberta Canal and Laterals, Mosida Canal, Pump Plants and Laterals and Nephi-Sevier Canal.

Question: What is the current status of planning and design for Jordanelle Dam and the other features of the Bonneville Unit?

Answer: Design work for Stage I of Jordanelle Dam is complete and the contract is set for a June 1987 award. Stage 2 is being designed and is scheduled for completion in July 1988. The design work on the relocation of Highways 40 and 189 is nearing completion. The first construction work on the road will get underway this summer. The rest of the Municipal and Industrial System is virtually complete. The design of Syar Tunnel on the Diamond Fork Power System is scheduled for completion in June 1987. The design work for Monk's Hollow Dam (9/89), Diamond Fork Pipeline (10/89), Fifth Water Aqueduct (2/91), and Last Chance Powerplant (7/92) will follow. The Irrigation and Drainage System Final EIS is scheduled for completion in August 1988 followed by the Supplement to the Definite Plan Report in September 1988. Contract work will be accomplished from Fiscal Year 1989 through fiscal year 1995 on the Industrial and Drainage System.

Question: The FY 1987 Energy and Water Appropriations Bill provides that not more than 20 percent of the CUP's appropriation in any fiscal year be expended on administrative overhead. Please provide me with the Bureau's percentage of administrative overhead on CUP in FY 1984, FY 1985, FY 1986, and FY 1987.

Answer: The Bureau's administrative overhead percentages for fiscal year 1984, fiscal year 1985, fiscal year 1986 and fiscal year 1987 are 13.0 percent, 12.1 percent, 12.6 percent, and 11.5 percent respectively. The fiscal year 1987 percentage is estimated.

Question: Of those funds expended on administrative overhead in the years listed in Question 3, how much of the administrative overhead was expended for salaries?

Answer: The percentage of the administrative overhead that was expended for salaries and benefits for fiscal year 1984, fiscal year 1985, fiscal year 1986 and fiscal year 1987 are 70 percent, 73 percent, 67 percent, and 59 percent respectively. The fiscal year 1987 percentage is estimated.

Question: Attached is the Bureau's forecast of utilization of construction funds for Bonneville Unit in FY 1987 as of February 1, 1987. Please define the following:

- noncontract costs
- direct noncontract costs
- indirect noncontract costs

**Answer:** Noncontract costs are essentially all costs incurred in the construction of a project other than payments made directly to contractors and are further categorized as either direct or indirect.

Direct noncontract costs are those costs which can be identified and charged directly to the feature or job of a specific project or activity. Examples of costs which are classified at this level are those incurred for design data collection, design, contract administration, construction supervision and inspection, lab work, land appraisals, studies and reports which are required as a prerequisite to construction and purchases of supplies and materials to be used for a specific job.

Indirect noncontract costs are those costs which are incurred in support of construction or other activities but because of their nature cannot be practically identified and charged directly to a feature or job level and must be distributed on an equitable basis to projects and features within the project. Examples of the most common types of cost which are considered indirect are region and project administrative functions, space, utilities, portions of ADP costs, and purchases of supplies and materials for operations.

## QUESTIONS SUBMITTED BY SENATOR DASCHLE

### WEB Project Delay

Question: The Administration has stated that it intends to accelerate construction of Bureau of Reclamation projects that are "substantially underway." The WEB Water System in northeastern South Dakota has over 65% of its federal funds already appropriated, the entire pumping plant is completed, over 77 miles of the main transmission line are constructed, and the project, if fully funded, could be completed in 1988. Given these facts, how can the Administration justify its recommendation to fund WEB at $2.2 million, instead of the $20.5 million that WEB was scheduled to receive? Isn't WEB exactly the type of "substantially underway" project the Administration says it wants to complete before more planning activities are undertaken?

Answer: On the WEB project, the funding amount was determined based on completing ongoing contracts of the system, with no funds provided for new contracts. WEB's ongoing contracts (those awarded prior to January 5, 1987) required little funding in FY 1988, thus the $2.2 million allocation. The WEB Project consists of discreet subunits for municipal and industrial water service. Substantial funding levels would be needed to begin new contracts to deliver water to the remaining units. The investment in the WEB project is primarily a grant, as 75 percent of the cost is nonreimbursable. The combination of these factors led us to conclude that the WEB Project did not meet the criteria necessary to execute new contracts at this time.

### Belle Fourche Project Delay

Question: The Administration has recommended that the rehabilitation of the 82-year old Belle Fourche Irrigation project, which has been underway for two years and is scheduled to receive $5.9 million in FY 1988, be considered a "new start," and should thus be delayed indefinitely. How can the Administration possibly substantiate its contention that the Belle Fourche project, which has served South Dakotans for over a century and is serving ranchers in South Dakota right now, is not a project that is "substantially underway?"

Answer: The Belle Fourche Project is an operating project. The rehabilitation work being done is now 13 percent complete. The project was considered to be one not substantially underway and, therefore was funded adequately to complete ongoing contracts and retain the project in a usable condition.

### Central Utah Project, Fontenelle Dam Reprogramming Action

Question: For months, the Bureau has been advising WEB, Belle Fourche, and two projects in other states, that nearly $13 million will be reprogrammed from those projects' congressionally approved budgets for FY 1987 to fund construction work at the Fontenelle Dam in Wyoming. That reprogramming will cut the Belle Fourche and WEB budgets by 23% each. Does the bureau intend to consult Congress before unilaterally rewriting the FY 1987 budget for these four projects?

Answer: Yes, a letter dated March 13, 1987, has been sent to the Committees on Appropriations concerning our intent to reprogram funds.

Question: The Belle Fourche and WEB projects had, of course, already expended much time and expense preparing their bids for this coming construction season based on the Congressionally approved budget. If at all possible, Congress would like to avoid situations like this in which projects have congressionally approved funding revoked by the Administration in the middle of a fiscal year. This "stop and go" method of building a project is very inefficient use of federal tax dollars. The Administration has been studying the situation at Fontenelle for a number of years. Didn't the Bureau know when it came to Congress a year ago that it was going to need additional funding for Fontenelle.

Answer: No, not at that time. The FY 1987 budget was prepared during the last half of 1985 and was presented to the Congress in January 1986. This budget assumed a contract award for the modification of Fontenelle Dam in the early summer of 1987 with a 3-year construction period.

In May 1985, the Bureau began to build a test section to determine if Fontenelle Dam could be repaired economically. It was found that the method used was effective and that the dam could be repaired. During the spring of 1986 the uncontrollable runoff above Fontenelle Dam caused the reservoir to refill to a dangerously high level. This caused extreme concern about the integrity of the dam and the threat to loss of life and property downstream of the dam. That event impressed upon us the urgent need to complete the modification work as soon as possible. After the spring runoff receded and later in the summer of 1986, it was decided to extend the work an additional 400 feet in order to utilize the full 1986 construction season. During the fall of 1986 it was determined that a 2-year construction schedule would reduce the threat of damage to property and loss of life by 1 year and would also reduce the overall cost of the modification work.

Question: The sponsors of the projects the Bureau has singled out to bear the burden of the reprogramming required for work at Fontenelle are willing to do their part to help their friends at Fontenelle. They do, however, note that the Bureau has eighty-nine projects in its budget and, therefore, have cause to question why the Bureau has chosen to place the whole burden of the Fontenelle repair work on just four projects. What is the rationale for this highly selective reprogramming of funds?

Answer: A large portion of the FY 1987 funds are required to continue ongoing work and is therefore committed at the beginning of the fiscal year. Normally reprogramming funds are made available from slippage in the program. We reviewed our total construction program and determined there was very little funding available from slippage. We then reviewed all construction projects with unobligated funds that could be transferred with the least impact to the total Construction Program. There are seven projects identified that had unobligated funds that could be made available for this safety work.

## Questions Submitted by Senator Pressler

### Delayed Projects Criteria

Question: Under the Administration's new policy, projects which are near completion will be accelerated while other projects are put on hold. The WEB project in South Dakota will be approximately 70 percent complete by the end of FY 1987. If funds were made available the project could be completed in FY 1988. In light of this fact, why did the Administration request only $2 million for WEB in 1988 and what was the criteria for determining which projects were near completion?

Answer: The basic criteria considered in allocating FY 1988 funding to the various projects include:

1. Meeting ongoing requirements on all projects.
2. Funding Safety of Dams work contracts currently underway at full capability level.
3. Funding environmental analysis and cleanup work on the San Luis Unit, Central Valley Project.
4. Executing new contracts on projects which are substantially underway and with large in-place investments and on which major project benefits with accompanying federal obligation repayment can be accelerated by concentrating construction capability on early or timely completion.
5. Selectively funding new contracts on projects with substantial non-Federal financing.
6. Funding new contracts on projects which meet other Department-wide priorities, such as Indian Claims and benefits.

On the WEB project, the funding amount was determined based on completing ongoing contracts of the system, with no funds provided for starting new contracts. WEB's ongoing contracts (those awarded prior to January 5, 1987) required little funding in FY 1988, thus the $2.2 million allocation. The WEB Project consists of discreet subunits for municipal and industrial water service. Substantial funding levels would be needed to begin new contracts to deliver water to the remaining units. The investment in the WEB project is primarily a grant, as 75 percent of the cost is nonreimbursable. The combination of these factors led us to conclude that the WEB Project did not meet the criteria necessary to execute new contracts at this time.

Question: The WEB project will receive a substantial amount of its funding through federal loans. The loans will not be repaid until the project is fully completed. The sharp cuts in WEB funding proposed by the Administration will postpone the repayment of WEB loans for several years. This seems to contradict the Administration's stated objective. If the objective of the Administration's policy is to get projects completed so they will begin repaying loans, why was funding for the WEB project cut so drastically?

Answer: It is true that repayment will not begin on WEB until it is completed. However, in the case of the WEB project, only 25 percent will be repaid. In any case, repayment of Reclamation projects is only one of our criteria for the award of new contracts.

### Belle Fourche Project

Question: The rehabilitation work on the Belle Fourche Irrigation project in South Dakota is currently underway. The Administration has proposed only $900,000 for the project in FY

1988. This level of funding will not allow much construction work to take place. Will the Bureau of Reclamation office in Belle Fourche be maintained to oversee this work? With limited funding requested will it be cost effective to maintain this office?

Answer: The Bureau of Reclamation will maintain the current staffing level during FY 1988. Since only minor rehabilitation work will be underway, most of the staff formerly associated with construction inspection will be redirected to preconstruction work.

## RIVER BASIN COMMISSIONS

### PREPARED STATEMENTS

Senator JOHNSTON. Before ending the hearing, I want to include in the record the prepared statements submitted to the committee from the Susquehanna River Basin Commission, the Delaware River Basin Commission, and the Interstate Commission on the Potomac River Basin. Those statements support the appropriation request for fiscal year 1988 for salaries and expenses of the Commissions.

So, without objection, those statements will be made part of the record.

[The statements follow:]

## STATEMENT OF WARNER M. DEPUY, U.S. COMMISSIONER, SUSQUEHANNA RIVER BASIN COMMISSION

Mr. Chairman and Members of the Committee: Again, it is a pleasure to appear before you. I do this in a dual capacity, in support of the appropriation request for salaries and expenses for the Office of the United States Commissioner and also for the Federal contribution to the Susquehanna River Basin Commission.

This Federal-Interstate Compact Commission was established pursuant to Public Law 91-575 among the States of Maryland and New York, the Commonwealth of Pennsylvania, and the Federal Government. The Compact serves as the vehicle to produce the most efficient service in the public interest in the conservation, utilization, development, management and control of the water resources of the Basin.

The Commission's membership consists of the Governors of the signatory states, or their appointed designees, and a Federal Member appointed by the President to represent all Federal Agencies. Historically, the Federal Member has been the Secretary of the Interior. In addition, each Governor and the President are directed to appoint a Commissioner to serve as alternate to the Member with identical powers of the Member, including the power to vote in the absence of the Member. The non-Federal staff of the Commission receives direction from the Members of the Commission through their alternates.

The duties of the Federal Member and the United States Commissioner are to represent the interests of the Federal Government on the Commission and to protect the national interests in the water resource development programs for the Susquehanna River Basin. To accomplish this, the Member and the Commissioner must work closely with all interested Federal Departments and Agencies, serving as coordinators to assure that Federal interests are fully informed regarding all water resources development programs for the Susquehanna River Basin. They also represent Federal interests in all actions by the Commission relating to the comprehensive plan and the advisability of individual water resource policies, programs, and projects which the Commission may propose or consider.

### SALARIES AND EXPENSES

An appropriation of $197,000 for fiscal year 1988 is requested to finance salaries and expenses necessary to enable the United States Commissioner to carry out his responsibilities to protect the Federal Government's interests in the Susquehanna River Basin. This is a $18,000 increase from the level appropriated by the Congress for fiscal year 1987.

### CONTRIBUTION TO SUSQUEHANNA RIVER BASIN COMMISSION

A request of $248,500 is to provide for the Federal Government's share of the $1,560,500 current expense budget of the Commission, and is a $8,500 increase from the level appropriated by the Congress for fiscal year 1987. The current expense budget covers expenses of the staff and the regular operating programs of the Commission.

Mr. Bielo, the Executive Director of the Commission, is accompanying me today and has submitted a statement to the Committee which briefly outlines some of our achievements. We will be happy to answer any questions you have regarding the Commission's current activities and new program initiatives proposed for fiscal year 1988.

## STATEMENT OF ROBERT J. BIELO, EXECUTIVE DIRECTOR, SUSQUEHANNA RIVER BASIN COMMISSION

Mr. Chairman and Members of the Committee:

On behalf of the Susquehanna River Basin Commission, let me express our appreciation for this opportunity to appear before you to discuss our programs, highlight major activities and to request your support for the proposed Federal share of the Commission's FY-88 budget.

As you know the Commission's programs are dictated, at least in general terms, by the Susquehanna River Basin Compact (P.L. 91-575). While six programs are designated by the Compact three areas: flood plain management, water supply, and water quality have received most attention.

Throughout 1986 the Commission continued coordination of a program to expand and improve the National Weather Service flood warning system in the Susquehanna River Basin.

The cooperation of the Congress in providing funds for this badly needed program has been outstanding as has been the cooperation of USGS and State and local government agencies.

Water supply concerns continue to receive a high level of attention. Low flow water supply management studies were completed for the Chemung River subbasin. Similar studies were initiated on the Main Stem Susquehanna River subbasin in New York State. These studies provide detailed information regarding water use, availability of supplies and outline areas having either surplus or deficit supply capabilities under varying drought conditions. Studies of principal ground-water aquifers continue with current work on the Chemung/Corning-Elmira area nearing completion. The study reports will include a detailed ground-water data base and geologic maps for the entire Chemung River subbasin, a ground-water flow model of the Corning aquifer system and pertinent aquifer management recommendations. Similar studies of other major ground-water aquifers will follow in succeeding years.

The Commission is pleased to report that its plans to develop water supply storage at Cowanesque Lake, a Federal flood control-recreation project in Pennsylvania, have been finalized. Contracts for the project were signed in June of 1986 and construction is expected to start in April 1987.

Through this project the Commission will return, over a period of fifty years, approximately $140,000,000 to the Federal treasury. The Congress has been most helpful in the effort to bring this project to a successful conclusion.

Two other Commission activities that contribute to National level water related programs involve work with EPA on Chesapeake Bay nonpoint source issues and on the restoration of anadromous fishes to the Susquehanna River system.

For the sake of brevity I have only touched on a few of the Commission's ongoing water resources programs. Copies of our annual report have been submitted to your staff and additional information is available if desired. In closing, I would request, on behalf of the Commission, your support for the proposed Federal share of our FY-88 operating expenses in the amount of $248,500 as indicated in the President's budget request.

## STATEMENT OF GEORGE J. KANUCK, U.S. COMMISSIONER, DELAWARE RIVER BASIN COMMISSION

Mr. Chairman and members of the Committee, I am George Kanuck, and it is a pleasure for me to appear before you again.

I appear before you today in support of two appropriation items totalling $466,000. These items consist of $203,000 for Salaries and Expenses for the operation of the Office of the United States Commissioner and $263,000 for the Federal Contribution to the Delaware River Basin Commission to implement the Compact. The authority and details relating to these requests appear in the formal "Justifications" document previously submitted to the Committee.

However, I would like to explain further the basis for the increases being sought in these two items over last year's appropriations.

With respect to the Salaries and Expenses request, the major portion of the $18,000 -- or $11,000 -- would cover increased costs arising from the recently revised Federal employee retirement program. Of the remaining $7,000 increase, $4,000 would cover the full year expense of the recent cost-of-living pay raise; $1,000 for a within grade increase; and $2,000 for increased rental charges by the General Services Administration as a result of the Fair Annual Rental (FAR) review conducted by that agency.

With respect to the Federal Contribution item, last year I sought to have all Federal moneys going to the Commission taken into consideration in determining the Federal fair share contribution--especially those Federal dollars which support long-standing and on-going programs of the Commission. Congress honored the Administration's request in furtherance of this policy by limiting the 1987 Federal Contribution to the $200,000 requested, and your approval of that request is appreciated. Again this year, the requested Federal Contribution of $263,000 is based on consideration of the total Federal dollars being sought to support long-standing Commission programs. For example, $503,000 Federal dollars are being requested for 1988--a basic Federal Contribution of $263,000 and a proposed Environmental Protection Agency water quality grant of $240,000. This proposed $503,000 Federal funding level compares well with State signatory funding levels which include their water quality shares, as follow: Delaware, $203,600; New Jersey, $550,000; New York, $298,400; and Pennsylvania, $631,900.

Mr. Chairman, accompanying me today is Joseph Tropea, the Interior Department budget analyst who assists my Office on budget matters. We will try to respond to any questions you may have regarding budget matters. As a matter of courtesy, Mr. Gerald Hansler, Executive Director of the Commission, is also accompanying me and is prepared to respond to questions involving details associated with Commission programs.

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## STATEMENT OF GERALD M. HANSLER, EXECUTIVE DIRECTOR, DELAWARE RIVER BASIN COMMISSION

Mr. Chairman and Members of the Committee

Thank you for this opportunity to present the Delaware River Basin Commission's FY 88 Budget. Copies of our proposed budget were submitted through channels to your subcommitte on February 10, 1987.

Our proposed budget calls for a Federal contribution of $263,000.

Also, we support the Corps' FY budget request for operation and maintenance within the Delaware River Basin and for the following projects:

| | | |
|---|---|---|
| F.E. Walter Dam Modification | : Construction | $3,900,000 |
| Prompton Lake | : Eng. and Design | 1,000,000 |
| Tamaqua Flood Control | : Construction | 3,000 000 |
| Delaware River Comprehensive Navigation | : Study | 750,000 |
| Camden, N.J., Delaware River Terminal | : Eng. & Design | 170,000 |

I would be glad to answer any questions now, or later in written form.

### STATEMENT OF ROCKWOOD H. FOSTER, COMMISSIONER, INTERSTATE COMMISSION ON THE POTOMAC RIVER BASIN

THANK YOU, MR. CHAIRMAN, FOR THIS OPPORTUNITY TO SUPPORT THE FISCAL YEAR 1988 FEDERAL APPROPRIATION FOR THE INTERSTATE COMMISSION ON THE POTOMAC RIVER BASIN. MY NAME IS ROCKWOOD FOSTER. I AM THE IMMEDIATE PAST CHAIRMAN OF THE COMMISSION AND ONE OF THREE COMMISSIONERS APPOINTED BY THE MAYOR OF THE DISTRICT OF COLUMBIA. I AM TODAY SUBSTITUTING FOR CHAIRMAN ROBERT CLAGETT OF MARYLAND WHO IS UNABLE TO BE PRESENT, AND I HAVE WITH ME, MARY-ELLEN WEBSTER, INTERIM DIRECTOR OF THE COMMISSION.

THE PRESIDENT'S FISCAL YEAR 1988 BUDGET RECOMMENDED NO APPROPRIATION FOR ICPRB. WE REQUESTED $79,000 AS THE FAIR FEDERAL SHARE OF THE TOTAL BUDGET OF $796,000. THE $79,000 IS THE SAME AMOUNT AS THE APPROPRIATION FOR THE CURRENT FISCAL YEAR.

THE ICPRB INCLUDES THREE COMMISSIONERS APPOINTED BY PRESIDENT REAGAN. THE PRESIDENTIALLY-APPOINTED COMMISSIONERS REPRESENT THE INTERESTS OF THE FEDERAL GOVERNMENT, ONE OF THE LARGEST WATER USERS AND RIPARIAN LANDOWNERS ON THE RIVER. THE FEDERAL SHARE HISTORICALLY HAS BEEN EQUAL TO THE LARGEST OF THE REQUESTED STATE CONTRIBUTIONS, WHICH IS FROM MARYLAND. IT IS TANGIBLE EVIDENCE OF THE FULL AND EQUAL FEDERAL PARTNERSHIP IN A VITAL JOINT MISSION.

#### APPROPRIATION AUTHORITY

THE AUTHORITY FOR THE FEDERAL APPROPRIATION TO ICPRB IS ARTICLE IV OF THE POTOMAC BASIN COMPACT AS AMENDED BY PUBLIC LAW 92-407, 91st CONGRESS, IN SEPTEMBER 1970. IT STATES "THE MONEYS NECESSARY TO FINANCE THE COMMISSION IN THE ADMINISTRATION OF ITS BUSINESS IN THE CONSERVANCY DISTRICT SHALL BE PROVIDED THROUGH APPROPRIATIONS FROM THE SIGNATORY BODIES [THAT IS, THE DISTRICT OF COLUMBIA, MARYLAND, PENNSYLVANIA, VIRGINIA AND WEST VIRGINIA] AND THE UNITED STATES..." CONGRESS HAS REAFFIRMED ITS ORIGINAL MANDATE BY APPROPRIATING FUNDS TO THE COMMISSION FOR A FEDERAL SHARE EVERY YEAR BEGINNING WITH FISCAL YEAR 1949.

YOU HAVE OUR BUDGET JUSTIFICATION SO I WILL ONLY BRIEFLY HIGHLIGHT MAJOR WORK PROGRAM ITEMS IN THIS SUMMARY STATEMENT.

## COOPERATIVE WATER SUPPLY OPERATIONS

THE ICPRB SECTION FOR COOPERATIVE WATER SUPPLY OPERATIONS (CO-OP) DEVELOPED AND IS IMPLEMENTING THE TECHNICAL FRAMEWORK FOR THE LOW-COST, LARGELY NON-STRUCTURAL, SOLUTION WHICH IS ASSURING ADEQUATE WATER FOR THE NATIONAL CAPITAL AREA INTO THE NEXT CENTURY. THE EIGHT AGREEMENTS SIGNED IN 1982 BY ICPRB, THE FEDERAL GOVERNMENT, THE DISTRICT OF COLUMBIA, MARYLAND, VIRGINIA AND TWO REGIONAL WATER UTILITIES INSTITUTIONALIZED THE FRAMEWORK AND THE ARMY CORPS OF ENGINEERS ACCEPTED IT AS BY FAR THE BEST SOLUTION IN ITS 1983 REPORT TO CONGRESS. THE SAVINGS OF $200 MILLION IN CAPITAL COSTS AS COMPARED WITH THE LEAST COSTLY OF PREVIOUSLY RECOMMENDED SOLUTIONS ARE IN STARK CONTRAST TO OUR FEDERAL APPROPRIATION REQUEST OF $79,000.

CO-OP'S DROUGHT MANAGEMENT SYSTEM DEPENDS ON (1) EARLY DETECTION OF DROUGHTS, BASED ON LONG-RANGE STREAMFLOW FORECASTS, (2) ACCURATE SHORT-TERM WATER USE AND SUPPLY FORECASTS DURING DROUGHT PERIODS, AND (3) OPTIMAL ALLOCATION OF SUPPLIES ON A REGIONAL BASIS DURING DROUGHT PERIODS.

ALTHOUGH POTOMAC RIVER SUMMER FLOWS WERE BELOW NORMAL FOR THE SECOND YEAR IN A ROW, THEY WERE ADEQUATE TO SUPPLY ALL WITHDRAWAL NEEDS AS FORECAST BY CO-OP IN THE SPRING. NEVERTHELESS, THE UTILITIES HELD RESERVE WATER IN LOCAL RESERVOIRS UNTIL CO-OP SHORT-TERM WATER USE AND SUPPLY FORECASTS DURING THE LOWEST FLOW MONTH OF SEPTEMBER CONCLUDED NEITHER THE LOCAL RESERVES NOR WATER SUPPLY RELEASES FROM THE UPSTREAM RANDOLPH LAKE (FORMERLY KNOWN AS BLOOMINGTON) WOULD BE NEEDED. AT THE SAME TIME, CO-OP, THE WATER UTILITIES AND THE CORPS OF ENGINEERS HELD THEIR ANNUAL DROUGHT EXERCISE IN WHICH CO-OP SIMULATES ON ITS COMPUTER SEVERE DROUGHT CONDITIONS AND THE NECESSARY COORDINATED OPERATIONS OF ALL UPSTREAM AND LOCAL RESERVOIRS AND INTAKES TO COUNTER THE SIMULATED EXTREME LOW POTOMAC FLOWS. THUS ALL CONCERNED REHEARSE ANNUALLY THE NECESSARY OPERATING PROCEDURES, INCORPORATE IMPROVEMENTS IN COMPUTER PROGRAMS AND OTHER ASPECTS OF THE COORDINATED

OPERATIONS, AND ARE PREPARED FOR ANY EXTREME DROUGHT CONDITIONS WELL INTO THE NEXT CENTURY.

## ALGAE BLOOMS

ICPRB CONTINUES TO RESPOND TO THE CHALLENGE OF A LEADERSHIP ROLE IN CONTINUING THE IMPROVEMENT OF WATER QUALITY IN THE POTOMAC ESTUARY, THE LARGEST ARM OF CHESAPEAKE BAY. IT IS EVEN MORE IMPORTANT BECAUSE OF THE EXTRAORDINARY BLUE-GREEN ALGAE BLOOM IN THE UPPER POTOMAC TIDEWATER DURING THE SUMMER OF 1983 AND LESSER BLOOMS IN SUBSEQUENT YEARS.

IN EARLY 1985 A PANEL OF ALGAE AND ESTUARINE EXPERTS COMPLETED ITS ASSESSMENT OF THE ALGAE PROBLEM AND CONCLUDED THAT THE RELEASE OF PHOSPHORUS FROM THE SEDIMENTS WAS A MAJOR CONTRIBUTOR TO THE 1983 BLOOM ALONG WITH THE UNUSUAL WEATHER AND FLOW CONDITIONS. ICPRB AND OTHERS ON THE POTOMAC STRATEGY COMMITTEE (USEPA, DC, MD, VA, AND THE METRO WASHINGTON COUNCIL OF GOVERNMENTS) CONTINUE TO FOLLOW UP THE EXPERT PANEL RECOMMENDATIONS TO DETERMINE ALTERNATIVES FOR CONTROLLING SUCH DAMAGING BLOOMS IN THE FUTURE. ICPRB'S ROLE INCLUDES SUCH WORK AS DETERMINING THE PROBABLE FREQUENCY OF CRITICAL WEATHER AND FLOW CONDITIONS FOR ALGAE BLOOMS; DEVELOPING INFORMATION ON CHARACTERISTICS OF SPECIFIC ALGAE SPECIES OF CONCERN; CALIBRATION AND VERIFICATION OF A PREDICTIVE SEDIMENT AND NUTRIENT RUNOFF MODEL IN THE MONOCACY SUB-BASIN, A MAJOR CONTRIBUTOR OF SEDIMENT AND NUTRIENTS TO THE RIVER; AND EVALUATION OF BENEFITS OF ACHIEVING ALTERNATIVE GOALS FOR REDUCING THE FREQUENCY AND INTENSITY OF THE ALGAE BLOOMS.

## SEDIMENT AND NUTRIENTS

ICPRB IS CONTINUING TO FOCUS OTHER STUDY EFFORTS ON THE TRANSPORT OF SEDIMENT AND ASSOCIATED NUTRIENTS TO THE ESTUARY FROM NONPOINT SOURCES SUCH AS AGRICULTURE IN THE UPPER BASIN. ESPECIALLY PHOSPHORUS, WHICH FREQUENTLY CAN LIMIT ALGAE GROWTH IN FRESH WATER SYSTEMS SUCH AS THE POTOMAC TIDAL RIVER, ADHERES TO SEDIMENT PARTICLES ERODED FROM THE UPPER BASIN. SEDIMENT IS TRANSPORTED SLOWLY DOWNSTREAM FROM ONE FLOOD PLAIN LOCATION (AND OTHER STORAGE SITES) TO ANOTHER. FOR EXAMPLE, DURING THE NOVEMBER 1985 FLOOD, TOP SOIL WAS COMPLETELY WASHED AWAY FROM

SOME CULTIVATED LANDS IN THE POTOMAC SOUTH BRANCH SUB-BASIN AND REDEPOSITED IN OTHER LOCATIONS TO LEVELS NEAR THE TOPS OF CORN STALKS. COMMISSION STAFF ARE NOW DEVELOPING A CONCEPTUAL SEDIMENT TRANSPORT MODEL WHICH WILL ALLOW THE ROUTING AND STORAGE OF SEDIMENT TO BE QUANTIFIED FOR CRITICAL RIVER SEGMENTS AND SUB-BASINS. CONCEPTUAL TRANSPORT MODELS ON SUCH A LARGE WATERSHED AS THE POTOMAC BASIN MAY BE THE ONLY WAY TO PROVIDE A VALID REPRESENTATION OF SEDIMENT AND ASSOCIATED NUTRIENT DELIVERY TO THE TIDAL RIVER AND ESTUARY. THUS THE COST-EFFECTIVENESS OF CHANGES IN UPPER BASIN LAND MANAGEMENT PRACTICES CAN BE EVALUATED IN TERMS OF THEIR IMPACT ON THE TIDAL POTOMAC AND BAY.

## EDUCATION AND INFORMATION

EDUCATION AND INFORMATION ALSO ARE IMPORTANT ACTIVITIES OF COMMISSION. THE MONTHLY "POTOMAC BASIN REPORTER" IS THE MOST WIDELY READ NEWSLETTER ABOUT WATER QUALITY AND OTHER WATER RESOURCES IN THE BASIN AND IS A SOURCE OF INFORMATION FOR NOT ONLY THE PUBLIC BUT ALSO FEDERAL, STATE AND LOCAL AGENCY PERSONNEL. THE COMMISSION ALSO PUBLISHES PERIODIC REPORTS ON WATER QUALITY CONDITIONS IN THE BASIN AND OTHER SUBJECTS OF SPECIAL CONCERN. FOR EXAMPLE, WITHIN A MONTH OR SO WE WILL BE DISTRIBUTING A NEW SPECIAL PUBLICATION ON "THE POTOMAC ESTUARY AND THE BAY". IT WILL CLARIFY MANY QUESTIONS IN THE PUBLIC MIND ABOUT THE RELATIONSHIP OF THE POTOMAC TO THE BAY, AS WELL AS SUBJECTS SUCH AS NUTRIENTS, SEDIMENT, ALGAE, TOXICS AND AQUATIC PLANTS. IT ALSO WILL PROVIDE UP-TO-DATE INFORMATION ON WHERE WE ARE AND WHERE WE'RE HEADED WITH PROGRAMS TO FURTHER IMPROVE THE TIDEWATER POTOMAC.

## CONCLUSION

AS WE HAVE TESTIFIED IN PREVIOUS YEARS, ICPRB PLAYS A UNIQUE INTERGOVERNMENTAL ROLE IN THE POTOMAC BASIN. IT HAS PUT FEDERALISM INTO SUCCESSFUL PRACTICE FOR 46 YEARS. WITHOUT FEDERAL PARTICIPATION, THERE WILL BE AN EMPTY PLACE AT THE TABLE. FEDERAL PARTICIPATION ENHANCES EFFICIENCY AND EFFECTIVENESS OF THE ESSENTIAL LOCAL-STATE-FEDERAL RELATIONSHIPS SO VITAL TO THE NATIONAL CAPITAL AND OTHER NATIONAL INTERESTS IN

THE BASIN. I FEEL STRONGLY THAT THE BENEFITS TO THE FEDERAL GOVERNMENT FAR EXCEED THE COST OF THE $79,000 APPROPRIATION WHICH WE ARE REQUESTING.

THANK YOU AGAIN FOR THE OPPORTUNITY TO TESTIFY, AND NOW MRS. WEBSTER AND I WILL BE HAPPY TO ANSWER YOUR QUESTIONS.

## INTERSTATE COMMISSION ON THE POTOMAC RIVER BASIN

## SUMMARY OF ACCOMPLISHMENTS

Fiscal Year 1986 (Oct. 1, 1985 to Sept. 30 1986)

### WATER QUALITY MONITORING COORDINATION, DATA MANAGEMENT AND EVALUATION

### Long-Term Water Quality Trend Report

The Draft 12-year Water Quality Trend Assessment Report covering the period 1973-1984 was completed and distributed to the U.S. EPA, the District of Columbia and to the basin states to aid them in the completion of their 1986 305(b) water quality assessment reports. Due to the enormity of the task of data reduction, the preparation and analysis of these data were automated by the development, verification and use of several data processing computer programs. The retrieval, from the U.S. EPA STORET system, of twelve years of monthly monitoring data for more than 100 water quality monitoring stations throughout the Potomac Basin was completed. Between 15 and 45 ambient water quality parameters were retrieved at each monitoring station. Significant analytical results were summarized in a data report which was automatically generated for each station, along with graphical representation of every parameter. With the TEKTRONIX plotter, graphs of the selected water quality data obtained from STORET were produced. The graphs were scatter plots which were useful in observing trends in the data. Significant trends in the data found in the monotonic screening analysis were always plotted. Other plots were produced for parameters of special interest or where trends were expected. Using these results, improvements as well as degradation in water quality can be identified both locally and regionally. Causes of significant trends in water quality and the effects of pollution controls implemented during the period of analysis were investigated. The executive summary of the report describes water quality trends for each subdivision. Included with this summary is a tabular listing of all trends on a single page, showing trends on a basinwide scale. The decision to produce a final trend report was deferred until FY 1987.

### Develop Regional Biodata System for Stream Quality Assessment

There has been some delay in obtaining a version of the Environmental Requirements and Pollution Tolerance System (ERAPT) program for ICPRB's microcomputer. ERAPT is composed of several separate programs and environmental tolerance databases. A microcomputer version is available, but two components that are of specific interest (the macroinvertebrates environmental tolerance database and the environmental tolerances editor) have not been released by the author, Dr. Hellenthal. ICPRB has expressed its desire to have these component programs as soon as they are available. In the meantime, the Maryland Office of Environmental Programs was contacted with regard to acquiring the sample data that will be entered into ERAPT and in developing evaluation procedures. ERAPT is currently available on U.S. EPA's STORET database in a somewhat limited form. In addition, a biological version of STORET (BIOS) has been under development by U.S. EPA. ICPRB has been investigating whether STORET can be used to accomplish some of the original goals of this task.

## Extend and Test Ambient Water Quality Screening Model

Using the results from the analysis reported April 1985 dealing with outliers in dissolved oxygen data as indicators of water quality degradation, the supplemental work located point source dischargers. These are potentially the cause of the unexpected ambient water quality values. Location of the water quality stations and dischargers was carried out using the new integrated database developed by the Water Quality Analysis Branch (WQAB) of the U.S. EPA. Graphics were prepared using the plotting functions of STORET in coordination with this new software package. The report of this second phase of work was completed. It provides a tool for water quality managers to use ambient water quality data with the integrated database system in order to promptly act on water pollution incidents. The report includes maps of dischargers and water quality monitoring stations on four stream reaches -- North Branch near Cumberland, South River near Waynesboro, Monocacy River near Frederick and Monocacy River near Dickerson. In addition, monthly discharge monitoring reports (DMR's) were obtained from Virginia for periods when dissolved oxygen values were flagged down by the statistical screening model developed in FY 1985. Similar data for Maryland should be available within a few months, after compliance with the state's lengthy Freedom of Information Act requirements. Discharge reports were limited to monthly averages. Daily operating logs for the dischargers would be more useful and attempts to obtain these records from the individual facilities will continue. Oxygen demanding loads were examined based on the discharge reports. Impacts on ambient dissolved oxygen are discussed in the report of this task.

The task comparing NPDES permit limits with actual discharges was deferred until FY 1987.

## Groundwater Database Framework

Relevant groundwater and health department personnel in the basin states were consulted with regard to present and planned groundwater data storage and retrieval systems. Staff attended seminars at U.S. EPA Region III involving the basin states on the subject of acquisition, storage and retrieval.

After obtaining the Users Manual for groundwater data on STORET from the Office of Solid Waste, U.S. EPA, all the groundwater monitoring stations in the Potomac basin were retrieved for examination of the availability and extent of data. STORET is one of the databases currently used to catalog groundwater data.

Staff met with the District Sanitarian, District Environmental Engineer, and County Sanitarians in order to discuss the detailed feasibility of a computerized groundwater database for the Eastern Panhandle counties of West Virginia. In addition, staff met with other West Virginia state agency personnel in order to discuss the proposed project and solicit comments. A project description, including computer hardware and software specifications, was developed by ICPRB. It formed the basis of a successful funding proposal to the West Virginia Department of Health. Funds for 3 computer equipped work stations were appropriated and hardware and software were purchased. The task of setting up the database software was begun.

## Basin Water Quality Network Maintenance

Normal duties of supervising, maintaining and managing ICPRB's Baseline Water Quality Monitoring Network (BWQMN) (including collection, analysis, interpretation and dissemination of water quality data) continued throughout the year.

Staff attended the National STORET users meeting held in Leesburg, Virginia. This conference, conducted by U.S. EPA, demonstrated the newest enhancements in the STORET system as well as related water quality information. At the meeting, contact was made with the basin state representatives. In attendance were staff from agencies in Pennsylvania, Virginia, West Virginia. Montgomery County, Maryland was also represented, and future meetings with them regarding their groundwater database are expected.

The monitoring of STORET use by the basin states was continued. After discussions with Maryland, U.S. EPA Region III and Maryland's contractor Martin Marietta, Maryland's water quality data from 1980 through 1984 was finally determined to be available for use by the STORET community. Water quality data after 1981 had been previously unavailable through STORET.

Staff met with Phillip Taylor of the U.S. EPA in order to discuss the new WQAB integrated database. A demonstration of the computer facilities at Waterside Mall was followed by discussion of various applications related to water quality analysis in general, and the Potomac basin in particular.

Membership in the Washington Area Waterfront Action Group (WAWAG) continued, as did ICPRB staff chairmanship of the WAWAG Fishing Committee. Membership also continued in the joint U.S. Army Corps of Engineers and Metropolitan Washington Council of Governments Potomac Hydrilla Management Committee (PHMC). The PHMC continued its efforts to develop an acceptable Hydrilla management and control program.

Requests for information from the public, students, consulting firms, and state and federal agencies were fulfilled. In particular, staff provided STORET data retrievals for individuals, federal and state agencies. Large data requests were provided to the Metropolitan Washington Council of Governments for data on the Anacostia River and to the National Park Service for data on Piscataway Creek and the Potomac estuary.

## Miscellaneous

A project, with report, was completed in which a joint probability distribution for water temperature and dissolved oxygen (D.O.) was estimated for the head of the Potomac Estuary. This information may be used by the D.C. Department of Consumer and Regulatory Affairs in order to investigate what period of the year more stringent water quality standards may be required because of high temperatures and low D.O.

Another project, with report, was completed on the comparison of water borne concentrations of nitrogen and phosphorous in baseflow and direct runoff. The analysis was carried out for major sub-areas of the Potomac basin, and the results applied to the construction of daily data records at the fall line during periods when data were not recorded. The results of this study were presented at the Chesapeake Bay Research Conference organized by the Virginia Polytechnic Institute and State University.

Staff participated in meetings of the Maryland State Water Quality Advisory Committee -- Nutrient Subcommittee, the Potomac Regional Monitoring Committee sponsored by the Metropolitan Washington Council of Governments, and other committees with oversight and advisory functions concerning water quality in the Potomac Basin.

## BASIN AND INTERSTATE PLANNING STUDIES AND COORDINATION

### Support for State/EPA Potomac Strategy Committee

Staff participated in the State/EPA Potomac Technical Subcommittee (SEPTEC) efforts to develop and coordinate a multi-agency program (Potomac Work Program) of technical studies designed to address issues related to eutrophication and low dissolved oxygen in the Potomac Estuary and its embayments. ICPRB participated in these studies described as follows.

### Monocacy River Modeling

After several organizational meetings, staff began their close work with Maryland Office of Environmental Programs (MD OEP) on water quality modeling in the Monocacy River catchment using the U.S. EPA's Hydrologic Simulation Program-Fortran (HSPF). A work plan was developed covering the anticipated 2-year duration of the project, and a letter of agreement between ICPRB and MD OEP was executed.

Staff became familiar with the details of the model, its data needs, and the major local water quality and conservation issues. Information sources were identified and evaluated in order to obtain needed resources, such as hardware and software support, existing databases, maps, etc.

Three specific goals for the model were identified: the reproduction of monthly constituent loads, the estimation of the relative constituent contributions from different land uses and pollution sources, and the projection of effects of agricultural best management practices on water quality. The availability of computer hardware and software for the considerable task of data collation and manipulation was investigated. Most of the data necessary for implementing the model were obtained, and sources for the remaining data were identified. The specific water quality constituents and pollutant sources to be modeled were selected. The chemical and physical processes to be modeled were also selected; and work progressed on the selection of years to be modeled, basin segmentation, and special actions and parameter development. The task of "Model Strategy Development", Item II. in the work plan, was substantially completed and "Time Series Data Development:, Item IV, was well under way.

## Frequency of Critical Events

Staff, in cooperation with personnel at Metropolitan Washington Council of Governments (COG) worked on this task to estimate the frequency of algae blooms under various hydro-meteorological conditions and STP treatment levels. Historical data were colated, from which probability distribution functions were calculated. After performing a Monte Carlo type procedure on this information, the results will be used as input to the Potomac Eutrophication model (PEM).

## Benefits of Achieving Alternative Tidewater Eutrophication Goals

After a literature search, preparation of plan and consultation with experts, a public opinion survey was conducted. It took place in late August as planned and included a small number of area marina operators and water sports-persons. The survey results will be summarized and compared with other information on the subject in a report.

## Algae Group Information

During the year, work was completed on the collection of algal bloom information from a wide variety of sources relating to the Potomac River. This information was correlated with chlorophyll-a concentration data for use with PEM in order to investigate algal population dominance and bloom frequency in an attempt to understand and predict bloom conditions. A draft report entitled "Potomac River Tidewater: Predicting Algal Species Dominance for use in Recalibrating the Potomac Eutrophication Model (PEM)" was prepared in order to present the results.

## Freshwater Inflow

Technical staff continued work on alternatives for increasing freshwater inflow to the Potomac Estuary through enhanced reservoir operation. The synthesis of both rainfall and runoff modeling continued to be developed in order to identify opportunities for real-time operational improvements in the use of existing reservoirs in the basin. Useful sets of downstream water quality targets were identified in conjunction with U.S. Army Corps of Engineers (COE) and MD Dept of Natural Resources (MD DNR) cold-water fishery personnel.

## Reservoir Operation Improvements

An analysis of flood control operation of Bloomington Reservoir was prepared which emphasized the opportunities to incorporate current hydrologic forecast information in hourly operation. Parametric operating rules were formulated and used to develop the trade-off between the reduction in peak flood flows and the required volume of flood control storage. Using current forecasts of runoff at each of the major gaging points on the North Branch, a multiple objective operating rule was formulated and used to develop the efficient trade-offs between the risks of flood damages and the risk of overtopping the reservoir. With this approach, the strategic decision operating targets can be updated and linked to tactical release decisions as hydrologic conditions change.

A short-term flood forecasting model was developed to provide current streamflow estimates as input for reservoir operation.

The forecasting model uses observed streamflow data to estimate effective precipitation on an hourly time step. The forecasting procedure produces good estimates and represents a significant improvement over comparable procedures that have been proposed. The results were presented in the report: "Analysis of Flood Control Operation in Bloomington Reservoir".

Investigation of the effect on water quality operations of reallocating flood control storage (free volume) to water supply storage in Bloomington Reservoir was continued and completed. This was accomplished through the use of joint simulation/optimization models which describe the physical and chemical characteristics of the reservoir. Various hydrologic regimes were examined in addition to a range of operational policies. Specifically, the reservoir was allowed to fill to three different levels (selected by the COE) at the beginning of the summer season, and was subsequently drawn down over a range of rates. Two hydrologic regimes were used: an average streamflow year and a below average streamflow year. The results were presented in the report: "The Effect on Water Quality Operations of a Reallocation of Flood Control Storage to Water Storage in Bloomington Reservoir".

## Gage Location

Work continued on the preliminary analysis for the location of a rainfall gage in the North Branch Sub-basin. The goal is to determine a configuration of gages which adequately represent rainfall intensity and patterns in the sub-basin. This is complicated by the fact that different types of storms, e.g. thunderstorms or frontal passes, are best represented by different gage configurations; and therefore, the choice of a gaging network with a finite number of gages may be viewed as a compromise between the ability to record the precipitation resulting from different types of storms. This compromise should be based on the storm patterns within the basin and the expected use of the data collected at the gages. In this case, the rainfall readings are used to forecast the inflow to Bloomington Reservoir. In order to measure the accuracy of the streamflow forecasts, location models which accommodate different objectives (the ability to observe storms of different types) are being linked with precipitation models and rainfall-runoff models. The location models were formulated for a design basin, and the precipitation and rainfall-runoff models were fine-tuned.

Technical support was supplied to MD DNR Water Resources Administration to identify a minimum flow requirement on the Susquehanna River for Chesapeake Bay water quality goals. Technical review and methodological suggestions were provided. Further development of salinity modeling of the Upper Bay was undertaken at ICPRB. This work will allow short-term fluctuations in salinity at critical locations to be quantified. The methodology may be generalized to any tributary of the Bay, and is being evaluated for application to the Potomac.

The Commission established "secondary user" status with NOAA's National Environmental Satellite Data and Information Service. This makes available, in near real-time, all data that is telemetered through the Geostationary Orbiting Environmental Satellite (GOES) system, which include the North Branch, and much of the main stem of the Potomac. Staff met with the Corps of Engineers to discuss operation of Bloomington Reservoir and streamflow forecasting using this satellite data.

## Evaporative Loss

The off-site evaporative loss resulting from the discharge of heated effluent was quantified for the major water users in and near the Potomac River Basin. This includes plants located on the Patuxent River, Chesapeake Bay, Patapsco River, and Gunpowder River. The task involved the development of a methodology for relating the evaporative loss to the quantity of the heated effluent discharged and the temperature differential between the discharged water and the receiving water. The analysis showed that the evaporative loss for these users is approximately 50 mgd in the summer months and 33 mgd in the winter months. This analysis provides information which is useful in accounting for evaporative losses which are otherwise usually overlooked. The results were presented in the report: "Evaporative Loss from Receiving Waters Due to Heated Effluent Discharges".

## Conservation Oriented Plumbing Codes

A study was conducted in order to determine the conservation potential of requiring water saving plumbing fixtures in the state of Maryland. Two scenarios were developed for residential sanitary fixtures (focusing mainly on the water use per flush of alternate toilet designs). Population forecasts were obtained from the Department of State Planning and in-home water use projections were produced through the year 2005. A significant reduction in water use could be obtained, even with growth in population, if low flush toilets were required to be installed in all new and remodeled housing and places of employment. The results of the study were presented in the report: "The Potential Impact of Conservation Oriented Plumbing Codes in Maryland".

## Effects of Water Conservation on Sewage Treatment Plants

A survey of sewage treatment plant operators at the larger plants in and near the Potomac River Basin was conducted on this subject. Water conservation would reduce the hydraulic load while increasing the concentration of pollutants. A number of competing effects were described; e.g. beneficially longer retention times in aeration basins, but this would be needed with the more concentrated influent. These, and other effects noted, are likely to compensate for each other. Any net beneficial or detrimental effects could not be determined to apply to all plants; instead, a detailed analysis would be required. It would include an assessment of individual plant processes. In any case, the net effect is likely to be marginal. The results of the study were presented in the report: "Effects of Water Conservation on the Operations of Sewage Treatment Plants".

## Interbasin Transfers between the Patuxent and Potomac Rivers

The location at which freshwater enters the Cheaspeake Bay may affect its overall quality; therefore, interbasin transfers within the Bay catchment may be important. A mass balance analysis was performed on several years of monthly water and sewage flows at Washington Suburban Sanitary Commission plants. There is one water treatment plant on each of the Patuxent and Potomac rivers, and several sewage treatment plants discharging to each of the rivers. The analysis determined the long-term and seasonal net transfer of water between the respective river basins. The results were presented in the report: "Interbasin Transfers between the Patuxent and Potomac Rivers".

## Sewer and Water Rates

The report on Phase 1 of the sewer and water rates was finalized. The second phase (focusing on assistance to the West Virginia Eastern Panhandle Region) was begun, but aborted due to unforeseen difficulties in developing useful results.

## Conceptual Sediment Transport Model

Considerable progress on the conceptual model of sediment transport and delivery was made. Several alternate model formulations were tested and compared. Using daily data from the Monocacy basin, the model has been calibrated and verified. The model reproduces historical loads with a high degree of accuracy, and it may be used for short-term forecasting of the daily load of suspended sediment. It also provides a means to infer the relative contribution of sediment stored in stream channels, banks, floodplains, and terraces to the daily suspended load. The contribution of sediment from each of these sources can be described on a daily basis as well as seasonally. Using the model, significant changes in the availability of sediment were also predicted within storm events. Analysis of daily observations of suspended sediment concentrations was performed, which confirmed these results. The conceptual model clarifies the importance of sediment availability and the transport capacity of the fluvial system in determining the total observed load of suspended sediment. Staff presented these results at a special section on Erosion of Agricultural Watersheds at the Spring Meeting of the American Geophysical Union.

Work to date suggests the importance of intermediate storage in controlling the net delivery of sediment from a basin the size of the Monocacy. This basin has been identified as a major contributor of sediment to the estuary. The work suggests a relatively small portion of the Potomac basin contributes a disproportionately large share of the observed load at the watershed mouth. A draft report was distributed for technical review.

## Potomac Sediment Storage and Transport

Additional field samples were collected and processed at the Occoquan Lab in order to assess bulk density and percent of organic matter in several representative storage areas. The sediment samples taken during the summer were processed for particle size distribution. The longitudinal profile was calculated. Channel margin profiles were plotted and areas of stored sediment calculated. The river was divided into representative reaches with regard to sediment storage characteristics, and total volumes of stored sediment were calculated and compared with sediment transport data. Graphics and presentation materials were prepared, and a final report was written. Results of the study were presented to the ICPRB Commissioners and MD Office of Environmental Programs personnel. Comments on the draft final report of this project were received from the Metropolitan Washington Council of Governments. These comments were taken into consideration during revisions to produce the final report "Sediment Storage and Transport in the Mainstem Potomac River Between Point of Rocks and Seneca Dam".

A study of the effects of the November 1985 flood in the upper basin was undertaken by a consultant. The results were presented to the Commission and documented in the report: "Floodplain Reconnaissance Study, November 1985 Flood, Potomac River Basin" by F. N. Scatena.

## Miscellaneous

A project, with report, was completed on the time-of-travel and dispersion model. The project included extending the model calibration to the South Branch Potomac and Shenandoah rivers based on data collected under cooperative arrangements by the U.S. Geological Survey. The report includes discussion of extension of the model to these tributaries, documents the model procedures, provides a users' operating manual, and gives a listing of the program.

The Commission was approached by representatives of the C&O Canal National Historic Park (NHP) to discuss technical and institutional responses to hazardous flow conditions in the Potomac. The flooding of November 1985 dramatically demonstrated the challenges of managing a park located in the floodplain of the Potomac River. The continuing safety problems in the vicinity of Great Falls pose unique management problems which will recur during the recreational season this year.

In response, joint meetings were held with representatives of the National Park Service (NPS) and the U.S. Army Corps of Engineers (COE) at ICPRB in order that NPS and C&O Canal NHP staff be aware of flood warning systems installed by the COE in the Susquehanna River basin. Staff at the National Weather Service and the Flood Management Division of MD DNR were consulted for relevant information which included presently available flood warning procedures for the Potomac. Commission staff also consulted with the Planning Division of the Baltimore District of the COE and Federal Emergency Management Agency, to identify available flood reconnaissance studies on the Potomac and its tributaries, relevant to the C&O Canal NHP. A number of such studies were identified, and efforts continued to develop a complete inventory of such information. Discussions of future technical support for the C&O Canal NHP, as well as additional interagency coordination, were ongoing.

The C&O Canal NHP prototype flow alert system was delivered to the NPS and is operational at Great Falls. Park rangers at Great Falls were trained to operate and interpret the system, and the response was quite favorable. Although no significant flow event occurred, the system proved useful in detecting malfunctions with streamflow gages on the Potomac. The system was demonstrated to the Regional Director of the NPS. The Park Service has indicated an interest in extending this work and discussions were begun in order to develop a work plan for the next fiscal year.

Staff attended the 1986 workshop for EPA's Water Quality Analysis Simulation Program (WASP) and installed this powerful model on the Commission's microcomputer.

Staff attended the February 20 meeting of the Chesapeake Bay Program (CBP) Implementation Committee at which progress with the CBP modeling programs took up much of the time. The Chesapeake Bay watershed model conversion to the CBP computer is nearly complete although some further verification with an additional data set and possible minor modification is scheduled before it is ready for use.

Other technical activities include participation in the State/EPA Technical Subcommittee which developed its Potomac Work Program to address water quality problems in the Potomac estuary. The Commission was represented on the Technical Advisory Committee of the Northern Virginia Planning District

Commission's Embayment Standards Study. In addition, staff continued participation in the Virginia State Water Control Board water supply studies for the Northern Virginia Metropolitan Demand Center and the Shenandoah River and Potomac River Tributaries Subarea. Staff also participated in meetings of the Metropolitan Washington Council of Governments Water Resources Planning Board.

Technical Staff continued to offer MD Water Resources Administration technical support for the state's consumptive water use regulation. Staff represented the Commission on the Virginia State Water Control Board's Shenandoah River - Potomac River tributaries Subarea Advisory Committee, and the Maryland Office of Environmental Programs' Middle and Lower Potomac River Basin Public Advisory Committees, and as Executive Secretary of the Maryland Power Plant Siting Advisory Committee.

Staff have continued development work on the computerized library reference catalog system (LREFS). The computer program was developed and the currently cataloged titles in the ICPRB library were entered into it. The procedure for proofreading, standardizing, and adding subject cross reference codes, for the titles in LREFS was completed. Work was begun on this final step in the development of LREFS, in which the professional staff are participating.

## PUBLIC EDUCATION AND INFORMATION

### Newsletter

The goal for the Newsletter, ten issues per year, was met. The number of subscribers to the newsletter remains the same, around 10,000. Maryland's Critical Areas Program, the aftermath of the November 1985 flood, Potomac boating access, Blue Plains expansion, the ICPRB North Branch Public Opinion Survey, the spring 1986 drought, the District of Columbia's fisheries program, and hydrilla were the highlights in this year's coverage. The format was altered with November-December 1985 issue, with the length shortened from 12 to 11 inches.

### Other Publications

"The Potomac & the Chesapeake", the third in a series of 16-page non-technical publications was published in January. This publication reaffirmed the Commission's 1983 resolution to give "first priority" to using its educational, as well as technical, capability on behalf of the Chesapeake Bay cleanup. The well received publication related the status on the Potomac River to those priority problems cited by the Chesapeake Bay Program: living resources, submerged aquatic vegetation, nutrients, and toxics.

The Commission sold and distributed as a courtesy almost 3,500 publications during this fiscal year. "The Potomac & the Chesapeake" made up 41% of the total, with the C&O Canal Map Sets and the Metropolitan Washington Potomac poster comprising 29% and 21% respectively. At the end of the year, all C&O Canal Map Sets had been sold.

Arrangements were made between the Commission and the Environmental Protection Agency's Chesapeake Bay Liaison Office to produce two Bay Program reports. The Public Affairs Specialist will produce a 28-page annual report of the Monitoring Subcommittee plus the 10-page insert of the second annual report of the Executive Council. The non-technical publications are targeted to environmental groups, resource managers, estuary programs, state and federal legislators and staff, technical and general media, and the broad public. Work related to this 6-month commitment began in June. The focus of these reports will be the monitoring results from 1984 and 1985--monitoring of the physical and chemical water quality, sediment and toxics, plankton, submerged aquatic vegetation, and Bay fisheries.

## Projects

Analysis of the results of the Commission's North Branch Public Opinion Survey (spring 1985) was completed and an unpublished report written. The 45-page report was made available for free to the public. The study found that the upper Potomac Basin was in need of more environmental education, particularly on acid mine drainage and soil erosion. The report was publicized through the Reporter and upper Basin news media.

Planning for the 1987 Public Meeting on the Anacostia was initiated. The date and site of the meeting were set: Saturday, April 25, 1987 at the Anacostia High School. An effort has begun to promote the Commission's meeting and complementary activities, as well as to encourage those of conservation groups and agencies engaged in improving the Anacostia and its watershed.

The 10th annual River Watch program (initiated in 1977) ran for fourteen weeks, from May 29 through August 28. Thirteen River Watchers were called weekly from Flintstone, Maryland (near Cumberland) to Pt. Lookout, Maryland and Smith Point, Virginia. Included among the River Watchers: four staff members from the National Park Service, three from Maryland state agencies, four marina owners, a staffer from the Potomac River Fisheries Commission and National Weather forecasters. Ten radio stations received the River Watch weekly recording.

The Public Information Officer continues to respond to information queries and to assist library users.

# COOPERATIVE WATER SUPPLY OPERATION ON THE POTOMAC (CO-OP)
## The Interstate Commission on the Potomac River Basin

## Director's Annual Report
## Fiscal Year 1986

During Fiscal Year 1986 major improvements to CO-OP operational capabilities resulted from automation of data collection. Retrieval of the following data, using the CO-OP Fortune and Compaq computers, has been automated: 1) precipitation data from the National Weather Service, needed for preparation of long-term forecasts; 2) streamflow data, needed for short-term forecasts of Potomac River flow at Washington D.C.; and 3) precipitation and streamflow data from the North Branch, needed for scheduling Bloomington water supply releases. During the summer of 1986 natural flow of the Potomac River has fallen to its lowest level since the drought of 1966 (800 mgd) in response to extremely low spring and summer precipitation. Decline in Potomac streamflow has been gradual in comparison to 1966, when Potomac flow dropped below 400 mgd by the end of August. The relatively slow recession of the Potomac this summer is attributable to groundwater recharge, which occurred during the previous fall. The main source of recharge was likely the Potomac flood of November 2-7.

## I. Operations

### A. Operational Forecasting

Water supply outlooks were issued beginning in mid-April. Unusually low spring and early-summer rainfall resulted in low forecasts of late-summer Potomac streamflow. By September natural flow of the Potomac River at Washington D.C. had dropped below 1000 mgd for only the second time since 1970 (the last time being the summer of 1977). Nonetheless, it was clear from August CO-OP forecasts that Potomac flow would not drop to levels which would result in water supply problems. The 1986 forecasting experience once again points out the importance of soil moisture storage in determining late summer baseflow of the Potomac. Despite the fact that summer rainfall during 1986 has been lower than during the summer of 1966, natural flow of the Potomac has fallen much more slowly than during the severe drought of 1966 (the minimum flow of 1966 was 388 mgd).

### B. Drought Exercise

The 1986 Washington Metropolitan Drought Exercise took place from July 14 - July 25. This was the first year in which the exercise was tied to actual flow in the Potomac (drought exercise flows were taken to be half the actual Potomac flow). Several important problems came to light. During much of the exercise the Potomac streamflow gage at Little Falls was malfunctioning. Washington area drought operations are critically tied to accurate flow measurements at Little Falls. The "backup system" used for Little Falls flow estimation was the C&O Canal data collection and forecast system developed by Stu Schwarz. The system, which is based on hourly streamflow data collected for the Potomac River at Point of Rocks and the Monocacy River at Jug Bridge, proved invaluable. CO-OP will use Stu's system next year for both short-term forecasting and for emergency data collection.

A major effort was made to involve the press in this year's drought exercise. Area newspapers, TV stations and, radio stations responded to requests to observe the exercise. Communication between the press and CO-OP went two ways. The press was informed about the need for holding a drought exercise and were requested to provide input as to what kind of information they would need to inform the public about a real drought. The advice offered by the press was unvarying: "State the facts simply and in as few words as possible!". The event attracting greatest press interest was the time-of-travel release made from Little Seneca.

The Little Seneca time-of-travel release not only focused press interest on the positive water supply activities taken in the Washington metropolitan area, it also served an important operational purpose. The release provided qualitative support for assumptions (such as the 12-hour wave travel-time to the WSSC Potomac plant) on which water supply operations are based. More information is needed to determine dispersion characteristics of Little Seneca releases. It was decided to make additional time-of-travel releases from Little Seneca in October.

It was determined during the exercise that accuracy of short-term demand forecasts is adequate for operational needs. The average absolute error of CO-OP one-day-ahead forecasts for the three jurisdictions was 25 mgd. The average absolute error for combined utility forecasts was 22 mgd.

## II. Improved Operational Capabilities

### A. Data Processing

A major accomplishment during 1986 was automation of data collection systems used for operational forecasting. Kathleen Hogan, working in coordination with National Weather Service staff, has automated precipitation data acquisition. This greatly simplifies preparation of long-range forecasts, as well as substantially reducing the likelihood of data entry errors. Kathleen and Dan Sheer also completed revisions to the long-range streamflow forecast system which reduce the number of data transmission steps in producing a long-range forecast.

Stu Schwarz created software which permits real-time retrieval of streamflow and precipitation data from the Geostationary Operational Environmental Satellite (GOES) data collection system using the CO-OP Compaq computer. Precipitation data for the North Branch of the Potomac and streamflow data on the main stem Potomac from Bloomington Dam to Shepherdstown can be obtained from the GOES system. Access to this data will be very important during periods when Bloomington water supply releases are being made.

B. Enhanced Water Supply and Demand Forecasting

The most notable enhancements to the CO-OP water supply system have stemmed from automated data collection. Short-term (1-5 days) forecasts of Potomac streamflow at Little Falls are now based on the hourly data collection system developed by Stu Schwartz. CO-OP has also implemented an adaptive version of the short-term forecast model used in previous years. The adaptive model differs from models used in the past by CO-OP in its ability to "learn" from its mistakes and improve tomorrow's forecast based on the error in today's forecast. Adaptive versions of the CO-OP demand forecasting system are currently under development. Work will continue on this aspect of the demand forecast system in the coming year.

C. Optimal Reservoir Operation

Stu Schwarz completed a project on dynamic allocation of flood control storage in Bloomington reservoir. The basic idea of this work is that during periods when flood risk is low it may be desirable (and possible) to increase storage for water supply and water quality purposes; conversely when flood risk is high, it may be desirable (and possible) to expand the flood pool. Research on "parametric operating rules" for reservoir operation was begun by Jim Smith. A major attraction of parametric operating rules for reservoir operation is that diverse types of water supply and demand forecast information are easily accommodated.

## SUBCOMMITTEE RECESS

Senator JOHNSTON. Now, the committee will stand in recess until Wednesday at 2 p.m.

[Whereupon, at 3:32 p.m. Monday, March 16, the subcommittee was recessed to reconvene at 2 p.m. Wednesday, March 18.]

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